MUSIC-BASED EMOTION REGULATION (MBER) INTERVENTION MANUAL FOR PREVENTION OF DEPRESSION IN OLDER PERSONS

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ABSTRACT

Despite unprecedented growth of the aging population and the need for evidence-based programs that target prevention of age-related depression, there is paucity of such programs in and outside music therapy. Lack of music-guided prevention programs makes it challenging for music therapists to make informed decisions about how to use music to increase emotion regulation skills of older adults in depression prevention framework. The purpose of this dissertation was to develop an intervention manual based on the Music-based Emotion Regulation (MBER) model, a theoretical model that suggests four emotion regulation strategies targeting depression prevention in older persons (Jang, 2016b). The manual was created within two integrated models of intervention and manual development (i.e. Preventive Intervention Research Cycle, Stage Model of Manual Development) and provided program overview, theoretical mechanisms of change, literature support, Therapeutic Function of Music Plan, program delivery schedule, session-by-session content, and fidelity criteria. The intervention was designed and described in a way that supports transparent and detailed reporting which may contribute to increased clinical utility, facilitation of replication studies, and further refinement and tailoring of the intervention. The manual development process was strategically placed within the author's own research and will direct future MBER research line. Implications and suggestions for future research and clinical practice are discussed.

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To Dr. Deanna Hanson-Abromeit, I appreciate your insight you have shared into intervention research. Your theory development class was the birth place of my MBER research line. It was a blessing to have known you and set a research trajectory centered around emotion regulation and depression. It is my hope to contribute to the profession by implementing this strategic approach to intervention-based research; thus allowing increased understanding about what we do as a profession.

To Dr. Abbey Dvorak, it was my honor to have my first publication with you in the *Journal of Music Therapy*. The skills that I have learned throughout the research process led to my intergenerational choir project which was the birth place for my interests in emotion regulation studies.

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Table of Contents

List of Tables

List of Figures

CHAPTER I

INTRODUCTION

The number and proportion of older persons are increasing dramatically. According to a recent report by the United Nations (UN), the number of older persons in the world, those who are 60 years or older, is expected to increase from 901 million to more than 1.4 billion between 2015 and 2030. The proportion of older persons is projected to outnumber children aged 0-9 years by 2030, and adolescents and youth aged 10-24 by 2050 (UN, 2015). In tandem with this increase in the aging population, 20% of older adults are estimated to have some type of mental health issues such as cognitive impairment or mood disorders, with depression the most prevalent (Center for Disease Control and Prevention [CDC], 2008).

Depression can be detrimental to older persons due to its direct influence on emotional, cognitive, and physical health leading to impaired functioning, risk of suicide, and tremendous disease burden associated with this life-threatening mental illness. Thus, a large number of health care professionals have emphasized the importance of preventing late-life depression before it becomes a clinically significant mental health issue. This emphasis is based on the premise that preventive efforts can lower incidence of depressive disorders; without prevention, the number of older adults with depression will increase with serious consequences along with this population growth (Almeida, 2014; CDC, 2008; Cuijpers et al., 2015; Fiske, Wetherell, & Gats, 2009; Institute of Medicine [IOM], 1994; Schoevers et al., 2006; Steenland et al., 2012).

Despite the unprecedented population growth and the need for evidence-based preventive programs, there is a paucity of such programs that specifically target the aging population and depression; although there are numerous preventive interventions available to infants, preschoolers, school-aged children, and adolescents (IOM, 1994). Therefore,

preventive approaches that stop or delay depression before it significantly impairs a person's ability to regulate emotion may enhance autonomy, increase a person's ability to lower disease burden, decrease suicide risks, and promote overall healthy aging (Jang, 2016b).

In response to this need for preventive approaches that may have a high impact on mental health, and even more specifically preventive programs that target depression in older adults, the Music-based Emotion Regulation (MBER) model was developed (Jang, 2016b). MBER is a theoretical model that proposes four music-guided emotion regulation strategies: Intentional Selection, Attentional Control, Cognitive Stimulation, and Social Interaction. Emotion regulation processes are "central to mental health; they can either support or disrupt the capacity to work, relate to others, and enjoy oneself" (Gross, 1998, p. 280). Emotion regulation studies postulate that maladaptive use of these strategies such as rumination and suppression contribute to pathogenesis of depression (Compare, Marconi, Shonin, van Gordon, & Zarbo, 2014; Gross, 1998); thus, the MBER model stresses building healthy and adaptive emotion regulation strategies in order to prevent depression in older persons.

Despite the complexity of the interplay among the music, an individual's level of music training, cultural influence, and personal music listening history, remarkable progress has been made in music and emotion research. This progress helps better examine the relationship between music and emotion, and provides much understanding about how music evokes emotions of a listener (Huron, 2006; Juslin & Sloboda, 2010; Juslin & Vastfjall, 2008, Koelsh, 2014) and how mood induction techniques can be used in clinical populations through mood-vectoring (i.e., directing one's affect to a desired state) (Thaut, 2005). However, existing theories about music and emotion do not provide sufficient explanation about how music therapists may therapeutically use music to alter clients' mood states in a

desired direction and help them build skills and strategies that are necessary to regulate emotions in and outside music therapy sessions.

Within the MBER model, Jang (2016b) posited that late-life depression can be prevented if older adults select situations that are emotionally meaningful, set up realistic goals, and put time and effort into achieving those goals (Intentional Selection); optimize attentional control through sensory processing of musical sounds, musical communication within the therapist-client relationship, and through interactions with other community dwelling older adults (Attentional Control); actively engage in music training that facilitates intellectual stimulation (Cognitive Stimulation); and participate in productive and meaningful social interactions that are safe and supportive (Social Interaction). Each strategy is defined and paired with music experiences that are supported by the neurological link between music and emotion regulation, and research findings in music psychology, music therapy, music education, and development and aging literature.

No universally accepted guidelines for intervention and manual development exist, yet advancement has been made in intervention research. This advancement provides invaluable insights about processes involved in developing an intervention, the factors that lead to effective interventions, and the steps to follow from pilot testing to designing large scale effectiveness trials that have the potential to impact public health. It was this author's intention to design an intervention manual informed by the discoveries of intervention researchers articulating how to design and develop effective interventions. Four primary discoveries that impacted this manual development are described here.

First, designing, implementing, evaluating, and adapting an intervention is a long-term process; thus, some researchers use the term "developmental intervention research" rather than simply intervention research (Gilgun & Sands, 2012, p. 349). Second, effective

interventions share common features in that they are grounded in theory; are multi component and multimodal; have outcomes that are closely related to the intervention intent; have participants actively engaged in building skills and problem solving; and involve end-users and/or stakeholders in the intervention development (Gitlin & Cjaza, 2015). Third, researchers interested in developing impactful interventions have created and used schematized intervention and manual development guidelines (Caroll & Nuro, 2002; Fraser & Galinsky, 2010; Gilgun & Sands, 2012; IOM, 1994; Melnyk, Marrison-Beedy, & Moore, 2012; Rothman & Thomas, 1994). Fourth, intervention development is an iterative process and a series of progressive stages with each successive stage addressing more complex clinical issues (Caroll & Nuro, 2002).

Intervention manuals provide descriptions of central elements that are thought to account for the intervention's effectiveness (Gearing et al, 2011), and include an overview of topics, session by session content, intervention activities, and necessary materials that are aligned with the central elements (Caroll & Nuro, 2002; Fraser & Galinskky, 2010). Comprehensive written manuals that clearly delineate important underlying risk and protective factors and their relevance to the intervention help impart current information associated with a clinical problem of focus, thus providing the necessary knowledge framework for education that may involve clients, family members, and stakeholders (Castonguay, Schut, Constantino, & Halperin, 1999). Additionally, detailed steps and procedures supported by the intervention theory provide an explicit plan of action as well as level of flexibility within a specified setting (Fraser, Richman, Galinsky, & Day, 2009). Furthermore, intervention manuals play a crucial role in evaluating fidelity. In other words, intervention manuals provide important markers for faithful and consistent adherence to core elements of an intervention (Gearing et al., 2011).

Although creating a manual is a necessary step before implementing or tailoring an intervention and provides remarkable benefits across all phases of intervention research (i.e., designing, implementing, and evaluating), there is a dearth of intervention manuals that thoroughly provide rationales for clinical decisions in music therapy. These decisions include supported choices of intervention structures and music selections, detailed intervention procedures that help facilitate the connection between theories and outcomes leading to an examination of therapeutic changes, and a level of adherence to or adaptation of the core components of the intervention. This dearth of manuals makes it difficult to replicate studies and creates a barrier between research and clinical practice that is frequently reported by clinicians in the field (Else, 2015; Thompson, 2015).

Therefore, the purpose of this dissertation was to develop an intervention manual based on the MBER model to facilitate clinical implementation and to direct future intervention-based research. The author articulated the process for and completed the actual creation of an intervention manual guided by problem (i.e., late-life depression) and program theory (i.e., the MBER model), with a synthesis of existing conceptual knowledge. This process is strategically placed within the author's own research line by illustrating its inclusion along a continuum of phases of research. Through this process, the author defined elements that are essential and unique to the music-based intervention and features that are commonly included in an intervention manual such as intended outcomes, program overview, and intervention structure and content.

To this end, in Chapter 2, the author established the problem theory by identifying the issue of late-life depression and prevention of depression in older persons within the Continuum of Care model suggested by the Institute of Medicine (IOM, 1994). Problem theory continued to be constructed by reviewing risk and protective factors associated with

late-life depression. In addition, the author established program theory by introducing the MBER model and reviewing existing interventions that focus on prevention and treatment of depression along with measurement tools widely used in and outside of music therapy. The functions and benefits of developing manuals were articulated to provide a rationale for the process and the actual outcome of this dissertation.

In Chapter 3, the author identified factors that lead to effective intervention design, which are the foundation of the overarching manual development process. The author provided detailed descriptions of what is included in the manual (i.e., structure and contents) within two integrated models of intervention and manual development (i.e. Preventive Intervention Research Cycle, Stage Model of Manual Development). The Therapeutic Function of Music (TFM) plan (Hanson-Abromeit, 2015) provided a conceptual methodology to define how music is guided by theoretical frameworks and expert opinions, what each music element does, and how each may be manipulated within the MBER model. The TFM plan is an additional and essential guide that informs fundamental components of the music (e.g., music selection, specific music strategies) as part of the MBER intervention manual.

Intervention research is defined as "research that involves the development and testing of practice models, description of change processes, and the application of models of practice to new populations and contexts" (Gilgun & Sand, 2010, p. 569). This definition implies that intervention research is a long developmental process and requires years of developing, testing, and adapting. The development of the MBER-guided intervention is a component of an early phase of a research agenda leading to large-scale clinical studies. A phenomenological study of an intergenerational choir experience with older persons and college students (Jang, 2015) prompted the development of the MBER model. This study provided a preliminary overview of the benefits of older adults' community level music

engagement. A systematic review of music interventions targeting the emotional needs of the older adult population helped examine trends, strengths, and limitations of emotion regulation studies within the therapeutic context (Jang, 2016a). The MBER model (Jang, 2016b) development initiated somewhat concurrent with the systematic review process, provided the theoretical foundation for this proposed intervention manual. In Chapter 3, the author offered more details about how these previous works are situated in her research agenda and systematic trajectory as delineated across each distinctive research phase.

In Chapter 4, the author presented a brief description of the program and directs readers to Appendix A. Appendix A is the actual MBER intervention manual that includes program overview, literature support, Therapeutic Function of Music Plan, program delivery schedule, session by session contents, and fidelity criteria. Literature support and the Therapeutic Function of Music Plan were directly informed by Chapters 2 and 3 of this dissertation so that music therapists who are invested in using this manual fully understand conceptual frameworks that lead to the critical elements of the program. Music therapists may benefit from this literature support which includes conceptually integrated synthesis of current knowledge in psychoeducation, theory-guided intervention delivery, dissemination of information in practice settings, and conversations with stakeholders in funding opportunities when necessary.

One of the challenges that prevention researchers face is to "package" their programs in a "user-friendly" manner (IOM, 1994, p. 430). Therefore, the author packaged the intervention so that (a) it is easy for practitioners to disseminate and implement the intervention; (b) it is user-friendly such that it can enable potential users and adaptors to readily acquire the skills needed for successful utilization of the procedures, and; (c) the

delivery process is elucidated with a high level of specificity, clear operational definitions, and visual demonstrations of the methods in action (IOM, 1994).

In Chapter 5, the author articulated strengths and limitations of this intervention manual. Several guidelines that pertain to qualities of effective interventions, intervention development, and intervention reporting were used to evaluate strengths and limitations of this intervention manual. Challenges that were experienced throughout the manual development process, implications and suggestions for future research and clinical practice, and closing with overall recommendations by the researcher were discussed.

In summary, this author systematically and strategically created an intervention manual by intentionally and explicitly outlining and articulating details necessary for the implementation of the MBER-guided intervention. This intervention manual will be used as a plan of action for clinical facilitation for the aging population, support transparent intervention reporting, allow for interventionist training when necessary, and provide important markers for fidelity checking (Fraser & Galinsky, 2010; Onken, Carroll, Shoham, Cuthbert, & Riddle, 2014; Robb, 2012).

CHAPTER II

REVIEW OF LITERATURE

The design of an intervention involves two integrated conceptualizations: problem theory and program theory. Problem theory "spells out putative risk and protective factors related to a specific problem" whereas program theory articulates logic of the intervention and functions as "the basis for the development of intervention manuals and protocols" (Fraser, Richman, Galinsky, & Day, 2009, p 62). Therefore, this author identifies the problem theory by articulating the epidemiological findings and reviewing risk and protective factors associated with late-life depression in a preventive framework. The author delineates the program theory by introducing the MBER model that suggests emotion regulation strategies that target decreased depressive symptoms in older persons. In the last section of this chapter, existing interventions as part of depression treatment and prevention are reviewed along with screening tools for which reliability and validity as well as sensitivity and specificity have been tested.

Conception of the Problem

Depression in older persons. Depression is one of the most common mental health disorders and is caused by a combination of genetic, biological, environmental, and psychological factors (National Institute of Mental Health [NIMH], 2016). Depression can be detrimental to the elderly population as it (a) complicates chronic diseases such as stroke and heart disease, (b) leads to higher functional impairment and disability; (c) increases mortality due to suicide or cardiac disease; (d) contributes to significant economic costs; and (e) threatens quality of life of older persons and their family members (Center for Disease Control and Prevention [CDC], 2012; Cuijpers et al., 2015; Sathyanath, Kundapur, Bhat, & Kiran, 2014).

Depression is not a normal part of aging and is often mistreated or undiagnosed due to symptoms being overlooked in the presence of other medical conditions, lack of knowledge about appropriate treatments, and individuals' lowered inclination to acknowledge feelings of sadness or grief (CDC, 2012). There are three types of depression: major depression, minor depression, and dysthymia (American Psychiatric Association, 2013). Symptoms and diagnostic criteria of these three types of clinical depression are described in Table 1. Epidemiological studies suggest prevalence of older adults developing major depression is relatively small and only accounts for 1-4% of the elderly population but the number increases dramatically to 4-13% when including minor depression (Alexopoulos, 2005).

Prevention of depression. The Institute of Medicine (IOM, 1994) divides intervention phases into prevention, treatment, and maintenance within the Continuum of Care model (see Figure 1). Prevention occurs prior to the onset of a mental health disorder. Treatment is implemented after the onset of the target disorder. Maintenance is an effort to reduce relapse or recurrence of the disorder after an individual experiences acute symptoms (Munoz, Beardslee, & Leykin, 2012). The Continuum of Care model has become a standardized way of conceptualizing prevention among policy makers, practitioners, and researchers in behavioral health science (Springer & Philips, 2006). Within the prevention phase, the IOM suggests three types of preventive interventions: universal, selective, and indicated (see Figure 1).

Table 1

Symptoms and Diagnostic Criteria of Clinical Depression
Source: American Psychiatric Association (2013)

Major Depression	Minor Depression
A. Depressed mood or loss of interest/pleasure over a two-week period accompanied by at least four of the following symptoms:	A. Depressed mood or loss of interest/pleasure over a two-week period accompanied by at least one of the following symptoms
1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) of observation made by others (e.g., appears tearful) 2. Markedly diminished interest or pleasure in al, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation) 3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. 4. Insomnia or hypersomnia nearly every day 5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down) 6. Fatigue or loss of energy nearly every day 7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day 8. Diminished ability to think or concentrate, or indecisiveness, nearly every day 9. Recurrent thoughts of death (no just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide	
B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning	
C. The episode is not attributable to the physiological effects of a substance or to another medical condition	
D. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.	
E. There has never been a manic episode or a hypomanic episode.	
Dysthymia (Persistent Depressive Disorder)	
A. Depressed mood for most of the day, for more days than not, for at least two years	
B. Presence, while depressed, of at least two of the following: 1. Poor appetite or overeating. 2. Insomnia or hypersomnia. 3. Low energy or fatigue 4. Low self-esteem. 5. Poor concentration or difficulty making decisions. 6. Feelings of hopelessness	
C. During the two-year period of the disturbance, the individual has never been without the symptoms in Criteria A and B for more than two months at a time.	
D. Criteria for a major depressive disorder may be continuously present for two years.	
E. There has never been a manic episode or a hypomanic episode, and criteria have never been met for cyclothymic disorder.	
F. The disturbance is not better explained by psychotic disorders such as schizophrenia.	

Universal interventions target the whole population whether the risks are large or small (Cuijpers, Beekman, & Reyholds, 2012). A community program that targets the entire elderly population to deter the onset of depression is an example of a universal intervention. Selective interventions focus on subgroups of a population whose risk of developing a disorder is above average and these subgroups may be identified by social demographics such as age, gender, or level of education (IOM, 1994). An intervention that targets a group of elderly women who recently experienced loss of a loved one may be an example of a selected intervention. Indicated interventions target individuals who do not fully meet diagnostic criteria but show symptoms just under the threshold for a specific diagnosis, thus who are at high risk for future development of the diagnosis (Cuijpers, Beekman, & Reyholds, 2012; Eyre, Baune, & Lavretsky, 2015). An intervention that is directed toward older adults in residential care facilities who are reported to show considerable depressive symptoms by staff and/or family members may be an example of an indicated intervention.

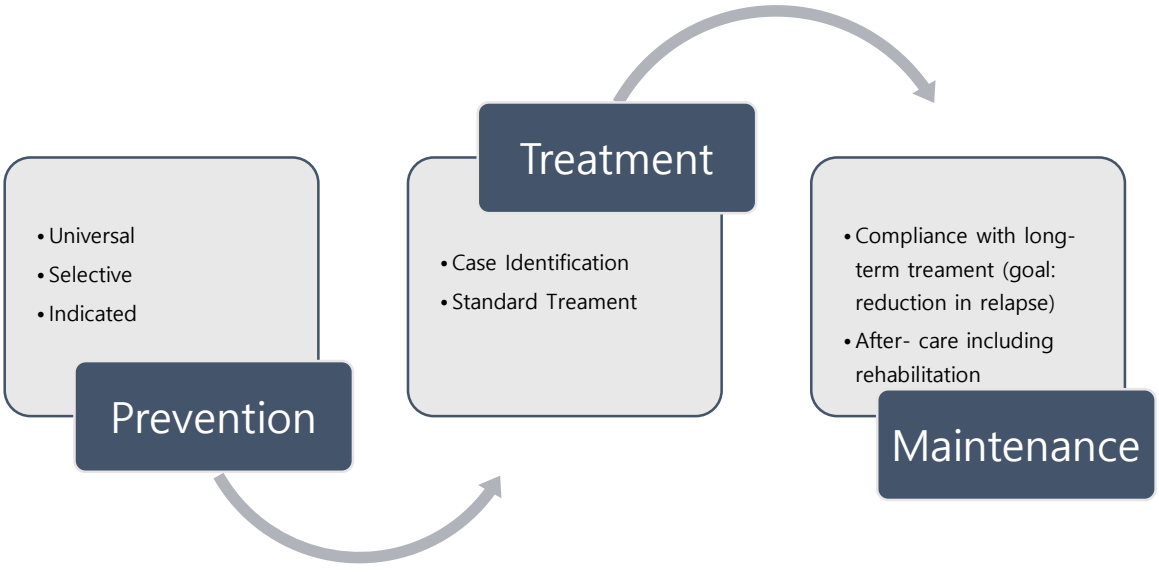

Figure 1. Institute of Medicine (IOC) Continuum of Care model
Source: Adapted from the Institute of Medicine (1994)

Major functions of all three types of preventive interventions – universal, selective, and indicated – are (a) to decrease the occurrence of new cases, (b) to delay the onset of a disease in addition to the absolute prevention of new cases, and (c) to reduce the length of time the early symptoms continue and subsequently prevent progression of severity so that individuals do not meet the diagnostic criteria (IOM, 1994). Health care professionals are consistent in their view to put stronger emphasis on prevention because these efforts could prevent 24.6% of new onsets in a three-year period and reduce a substantial amount of the disease burden (Schoevers et al., 2006).

Half of older persons with depression have their first onset in late-life; therefore, preventive interventions that target older adults who are subsyndromal (i.e. individuals who show symptoms just under the threshold for depression) at an earlier age may be the most promising approach in order to prevent development of the full-blown disorder (Fiske, Wetherell, & Gatz, 2009; Forsman, Schierenbeck, & Wahlbeck, 2011). However, interventions that target reducing the incidence of late-life depression are sparse; thus, this ever growing aging population calls for innovative and cost-effective preventive interventions that have a high impact on emotional health and subsequently promote healthy aging.

Review of Risk and Protective Factors

The process of critically identifying and examining risk and protective factors associated with a mental health disease is a crucial step to take when designing a preventive intervention as these interventions are often directed toward reducing risk factors and increasing protective factors (IOM, 1994). Within the Preventive Intervention Research Cycle that was conceptualized by the IOM, the initial step is to build a knowledge base through problem identification that is foundational to intervention development and refinement as identified in Figure 2. Reviewing risk and protective factors is the research step that follows

identifying a problem and examining its extent. In this section of the chapter, the author provides a definition of risk and protective factors, reviews risk factors using three categorical descriptors (i.e. biological, psychological, and social), and then articulates protective factors associated with depression in older persons.

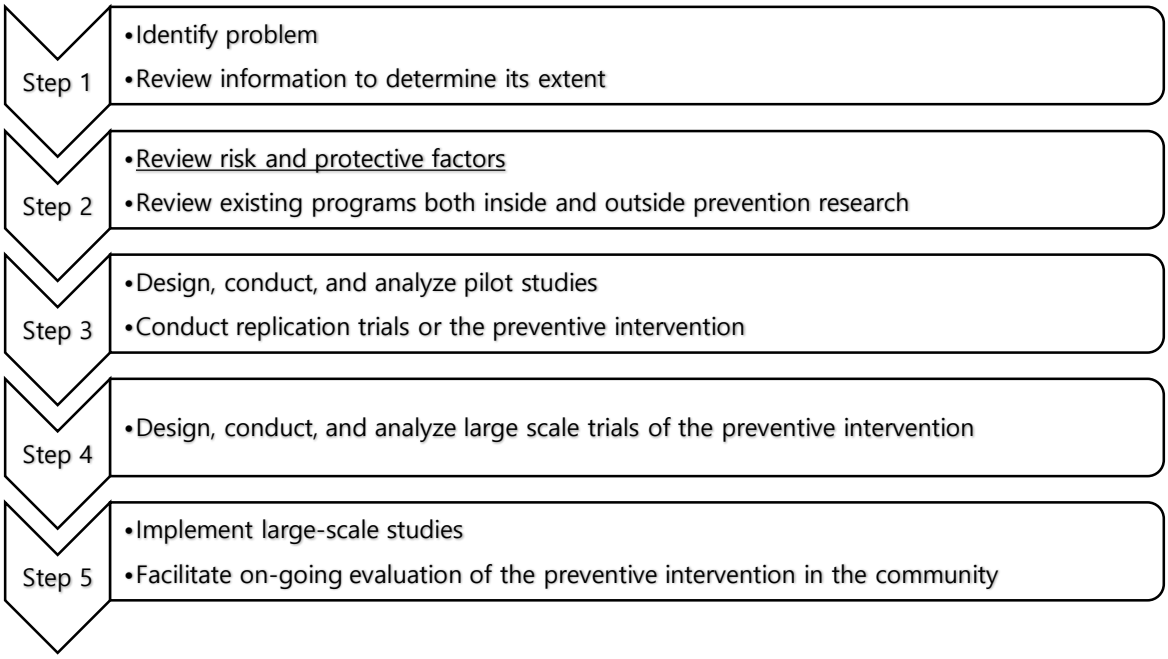

Figure 2. Preventive Intervention Research Cycle
Source: Institute of Medicine (1994)

Definition of risk and protective factors. Risk factors are those factors that increase the likelihood of developing a disorder if present for a given individual rather than someone selected at random from the general population (IOM, 1994). Risk factors associated with a disorder may reside within the individual, family, or community and can be biological, psychological, or social in nature (Alexopoulos, 2005; IOM, 1994; Vink, Aarten, & Schoevers, 2008). Some risk factors play a causal role and others merely increase vulnerability to a specific disease.

Protective factors are those factors that "enhance the likelihood of positive outcomes and lessen the likelihood of negative consequences from exposure to risk" (World Health

Organization, 2004, p. 1), are expressed at the individual, family, or community level, and can be biological or psychological, or social in nature (IOM, 1994). It is important to note that both risk and protective factors do not function in isolation; rather "there exists a dynamic interaction among them that undergoes modification and change throughout an individual's life span" (IOM, 1994, p. 186).

Biological risk factors. Although the exact weight of genetic and non-genetic factors remains to be examined, there is strong support that risk for mood disorders becomes larger when genetic transmission occurs (IOM, 1994; Oldehinkel, Ormel, Brilman, & van den Berg, 2003). Genetic markers for late-life depression have not been clearly identified but a twin study suggests that hereditary factors account for 18% of the variations in depressive symptoms (Alxopoulos, 2005; Gatz, Pederson, Plomin, & Nesselroade, 1992). However, less severe forms of depression such as minor depression show less heritability (Tsuang & Faraone, 1990).

Eighty percent of older adults have at least one chronic health condition while 50% have two or more. This increases the likelihood of older adults developing depression because depression is more common in people who have other chronic health conditions (CDC, 2012). Braam et al. (2005) found a linear association between depressive symptoms experienced in later life and chronic diseases and functional disability. It is reported that about 25% of individuals with myocardial infarction have major depression and another 25%, minor depression (Alexopoulos, 2005). Use of psychotropic medication also increases the risk of depression. Lists of medical conditions and drugs associated with late-life depression are summarized by Alexopolous (2005) and provided in Table 2.

Table 2

Medical Conditions and Drugs Associated With Late-life Depression
Source: Alexopoulos (2005)

Medical Conditions Associated with Depression	**Drugs Associated with Depression**
Viral infection	Methyldopa
Endocrinopathy e.g.,hypothyroidism, hyperthyroidism, hypoparathyroidism, hyperparathyroidism, hypoadrenocorticism, hyperadrenocorticism, Cushing's disease	Benzodiazepines Propranolol Reserpine Steroids Anti-Parkinsonian drugs ß blockers Cimetidine Clonidine Hydralazine Oestrogens Progesterone Tamoxifen Vinblastine Vincristine Dextropropoxyphene
Malignant disease e.g., leukemia, lymphoma, pancreatic cancer	
Cerebrovascular disease e.g., lacunar infarcts, stroke, vascular dementia	
Myocardial infarction	
Metabolic disorder e.g., B12 deficiency, malnutrition	

Neuroimaging and neuropsychological studies in clinical aging literature have identified vascular factors that increase the risk of depression in later life: cerebrovascular incidents, cardiovascular factors, white matter hyperintensities, atherosclerosis, high blood pressure, and foetal undernutrition (i.e. fetal malnutrition) (Hickie et al., 2003; Vink, Aartsen, & Schoever, 2008). Some researchers used a term, vascular depression, to describe the relationship between cerebrovascular disease and disruption of fronto-subcortical circuits that regulate mood, cognition and movement, especially for those who experience depression for the first time after 50 years of age (Alexopoulos et al., 1997; Hickie et al., 2003; Krishnan, Hays, & Blazer, 1997; Krishnan & McDonald, 1995).

Jorm et al. (2005) found significant association between white matter hyperintensities and depression in older adults in an MRI study that involved 475 community samples of individuals aged 60 to 64 and provided support for the existence of vascular depression.

Tiemeir et al. (2004) investigated the relationship between atherosclerosis, the most common underlying cause of heart attack and late-life depression and found that for every one standard deviation increase in more severe extra-coronary atherosclerosis, the prevalence of developing depression increased by 30% in a large prospective, population-based cohort (i.e., Rotterdam) study.

Hybels, Blazer, and Pieper (2001) identified risk factor profiles of 162 community-dwelling older adults divided into two groups, one with more severe depression and one with sub-threshold depression, and found that depression in both groups was associated with impairment in physical functioning, disability days (i.e., one in which a person spent all or partial day in bed or was kept from usual activities due to illness), and poor self-perceived health. In addition to the actual and perceived health conditions, changes in physical health, new medical illness, sleep disturbance, low level of exercise and physical activities also increase the likelihood of developing depression in older persons (Jang, Haley, Small, & Mortimer, 2002; Livingston, Blizard, & Mann, 1993; Lyness, Duberstein, King, Cox, & Caine, 1998; Vink, Aartsen, & Schoevers, 2008).

Although it is difficult to determine whether a condition or behavior causes depression or depression is the cause of a condition or behavior, there are some conditions and behaviors known to have an association with depression in older adults such as smoking, alcohol consumption, and obesity (CDC, 2016; Vink, Aartsen, & Schoevers, 2008). Although its hallmark is cognitive decline, Alzheimer's disease is also reported to show an association with depression as 25% of individuals with Alzheimer's disease experience depression that is characterized by less control over their feelings and how they express them (Alexopoulos, 2005; Lyketsos & Olin, 2002).

Psychological risk factors. Research has shown correlations among psychological risk factors which include coping strategies, locus of control, personality traits, and depressive symptoms in the elderly population. Coping refers to "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transaction" (Folkman, 1984, p. 843). Coping has two major functions: regulation of emotion or distress (i.e., emotion-focused coping) and management of problems that cause distress (i.e., problem-focused coping) (Folkman & Lazarus, 1980). Problem-focused coping is accompanied by emotion-focused coping in most stressful encounters because it is required to have at least some control over one's emotions when trying to manage stressful situations (Folkman, 1984). Dysfunctional emotion-focused coping such as ruminating and catastrophizing can be detrimental and is significantly related to depression (Kraaij, Pruymboom, & Garnefski, 2002; Thompson et al., 2010). Maladaptive coping strategies, such as avoidance, especially among elderly cancer patients, may also increase risk of individuals developing depression (Aarts et al., 2015).

Locus of control is a concept that describes the extent to which an individual expects that an outcome of his/her behavior is contingent on his/her own behavior or personal characteristics (Rotter, 1990). People with high internal locus of control believe that they have control over the events that influence their lives. In contrast, people with high external locus of control believe that they have little control over what happens around them and the amount of effort they put into a situation has little impact on the consequences of their actions. Studies show use of more external locus of control and less problem-focused coping strategies are associated with depression in older adults, and the correlation is stronger with those who were hospitalized compared to community-dwelling older adults (Beekman et al., 2004; Bjorklof et al., 2016).

Inherent personality traits are also associated with depression. The Five-Factor Model suggests that personality can be described in five broad dimensions: Openness to Experience or Intellect, Conscientiousness or Will to Achieve, Extraversion or Surgency, Agreeableness as the opposite of Antagonism, and Neuroticism or Emotional Liability (McCrae & Costa, 2008). Among these five personality traits, Neuroticism is directly related to emotion regulation because individuals who score high on Neuroticism tend to be more prone to mood swings and emotional reactivity, more vulnerable to high stress, and more likely to experience depression and anxiety (Koorevaar et al., 2013; Peerenboom, Collard, Naarding, & Comijis, 2015). In addition, individuals who score low on Extraversion (i.e., positive motion and activeness) are more likely to show depressive symptoms than those with high Extraversion score (Peerenboom, Collard, Naarding, & Comijis, 2015).

Social risk factors. Researchers have identified lack of social support, experiences of negative life events, and some demographic features as social risk factors. Social support is one of the social determinants in the general population and there are two types of social support as identified in Cobb (1976): structural and functional support. Structural support is about amount, density, and frequency of contact while functional support is the quality of the support given by one's social network. Older persons who experience a lack of social support on both structural and functional levels and as such suffer from social isolation are at a high risk of developing depression (Alexopoulos, 2005; Beekman et al., 2004; Grav, Hellzen, Romild, Stordal, 2011; Vink, Aartsen, & Schoevers, 2008). Emotional loneliness, often characterized by lack of social interaction, also increases depression (Peerenboom, Collard, Naarding, & Comijs, 2015).

In addition, Kraaij and de Wile (2001) found that a depressive mood at an older age was related to negative life events, emotional abuse and neglect experienced during

childhood, sexual abuse and neglect, and relational stress with significant others experienced during (late) adulthood. Also, the sum of all negative life events across the life span has a positive relationship with depressive symptoms in later life; however, when experiencing more recent adverse life events, older adults are more prone to suffer from depression (Beekman et al., 2004)

Studies show that some demographic factors have a correlation with age-related depression. The following conditions are reported to increase the likelihood of an older person developing depression: marital status (i.e. unmarried, divorced, or widowed), gender (i.e. female), living condition (i.e. living alone, living institutionalized), fulfilling a care giver role, lower level of education, lower socioeconomic status, and more severe medical conditions (Alexopoulos, 2005; Beekman et al., 2004; Hybels, Blazer, & Pieper, 2001; Lee, Hasche, Choi, Proctor, & Morrow-Howell, 2013).

Protective factors. Existence of social support, individuals' positive perception about their support system, and engagement in spiritual practice serve as protective factors. Social support is defined as information leading the subject to believe that (s)he is cared for and loved, and is an esteemed and valued member of a network of communication and mutual obligations (Cobb, 1976). Social support in aged persons makes an important protective contribution against depression and functions as emotional, informational, and instrumental (e.g., providing rides) support (CDC, 2008). Gender differences seem to exist when receiving support as women seem to prefer more emotional support that involves caring, empathy, love, and trust while men prefer more instrumental support such as provision of tangible goods and services (Grav, Hellzen, Romild, & Stordal, 2011). Along with the nature and quality of the social network, one's positive perception about the support system also plays a protective role against depression (Cummings, 2003).

Engagement in spiritual practice also correlates with better physical and mental health that includes decreased depressive symptoms and increased self-efficacy and health conditions (Cummings, 2003). Braam et al. (1997) examined the association between religious involvement and depression in 2,817 Dutch citizens aged 55-85 years and found that religious involvement assessed through frequency of church attendance and strength of church affiliation, had a negative relationship with depression, both on symptom and syndrome levels. In addition to participation in religious activities, private spiritual practice such as Bible reading and prayer was also associated with lower levels of depression among community-dwelling older adults and individuals in nursing homes (Cummings, 2003). Also, individuals who report high levels of spirituality often characterized by finding meaning and purpose in life show less depressive symptoms (Bamonti, Lombardi, Duberstein, King, &Van Orden, 2016).

MBER as a Program Theory

Theories in intervention research play a crucial role in all phases of research (i.e., development, evaluation, and implementation). Program theory (a) guides selection of important components of intervention delivery; (b) informs evaluation process (i.e., fidelity check); (c) provides information on how and why an intervention works; (d) aids identification of aspects of an intervention that need to be modified or adapted based on contextual factors, such as practice settings and cultural variations; and (e) provides basis for underlying mechanisms of change (Gitlin & Czaja, 2015). Theory-based intervention research, particularly in music therapy helps “advance our understanding of the complex interactions between music, clients, and the education or healthcare environment” (Robb, 2012, p. 5).

The Music-based Emotion Regulation (MBER) model was originally developed to inform intervention research and clinical practice through a conceptualization of music guided emotion regulation strategies that target older persons and depression prevention (Jang, 2016b). Emotion regulation refers to "extrinsic or intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features to accomplish one's goals" (Thompson, 1994, p. 27-28). Emotion regulation is context dependent but there are three factors that are common for adaptive emotion regulation: awareness, goals, and strategies (Thompson, 1994).

In the MBER model, Jang (2016b) proposes four active emotion regulation strategies that may help prevent older adults from developing depression: Intentional Selection, Attentional Control, Cognitive Stimulation, and Social Interaction. This theoretical model is guided by neuroscience research in music, music psychology, music therapy and music education research, human development and aging literature, and emotion regulation studies. It provides a theoretical support for the regulatory use of music on an individual, social, and community level. Definition of these four strategies and music experiences that music therapists may use under each strategic component of the model are illustrated in Figure 3.

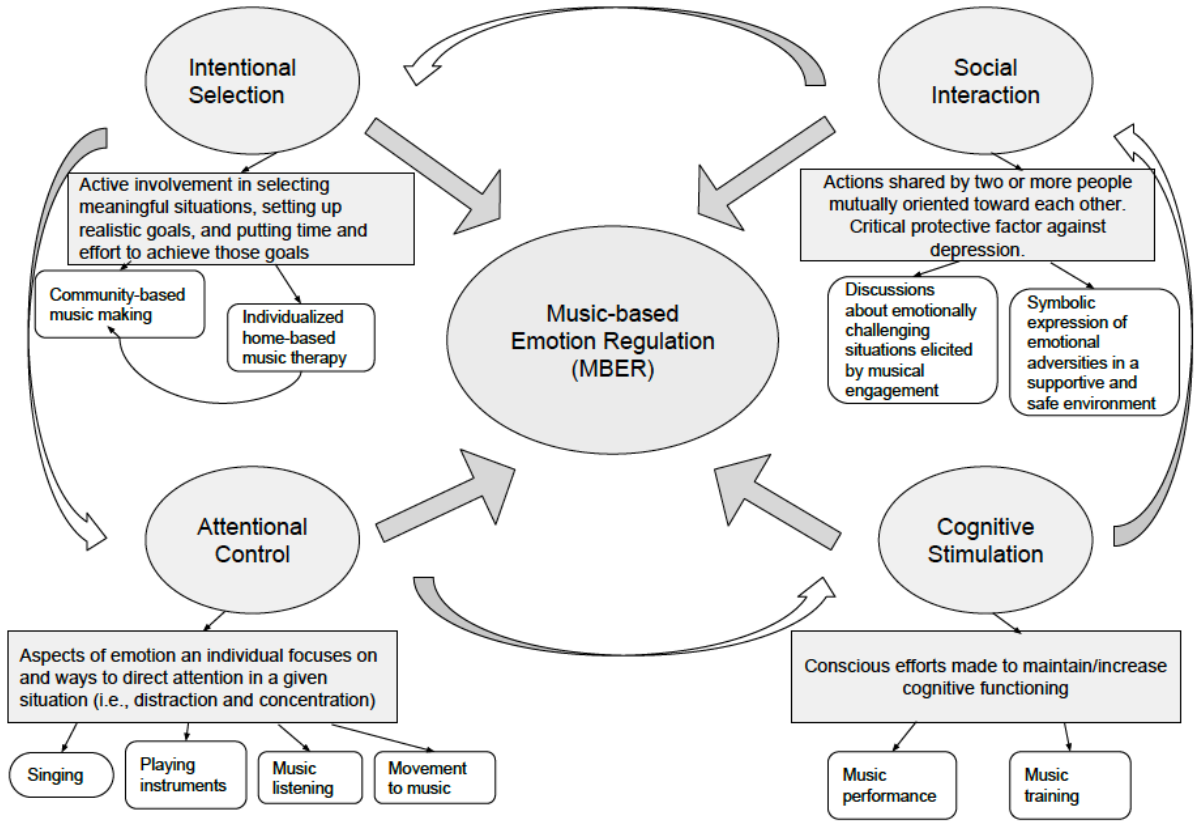

Figure 3. Music-based Emotion Regulation (MBER) model
Source: Adapted from Jang (2016b)

Intentional Selection. Intentional Selection refers to "how one decides which situations to select, how to set up and achieve goals, and what strategies to use to compensate for age-related physical, cognitive, and psychosocial losses" (Jang, 2016b, p. 10). Music therapists provide community-oriented music experiences that older adults select and actively engage in to expand their cognitive and socioemotional resources by using internal (i.e., ability to predict emotional outcomes in a particular situation) and external (i.e., ability to select social relationships that bring positive experiences) resources (Baltes & Baltes, 1990; Jang, 2016b). Active involvement in community-based music making is associated with feelings of control and autonomy, social affirmation, and a sense of purpose (Creech, Hallam, Varvarigou, McQueen, & Gaunt, 2013); thus, it is the therapist's role to create emotionally

challenging yet safe places for community dwelling older adults to become invested in taking an active position in decision making and problem solving, which may contribute to building a reservoir of resources to use for a desired emotional state (Hallam, Creech, Varvarigou, & McQueen, 2012).

For individuals who do not have cognitive capacities to expose themselves to socially complex situations, music therapists provide individualized home-based care tailored to their unique needs through which older persons build rapport with the therapist, engage in music experiences in a supportive therapeutic relationship, and work toward meaningful emotional goals (Jang, 2016b). Involving family members in psychoeducational activities, as well as music making experiences, may also help older adults gain feelings of empowerment in working toward the identified goals, get outside of the home, and participate in community-based activities.

Attentional Control. Once an individual selects emotionally meaningful situations, the person practices attentional control. Attentional Control refers to "which aspects of emotion a person focuses on and how people direct their attention within a given situation to alter their emotional experiences" (Jang, 2016b, p. 12). One may use distraction strategies to direct his or her attention away from a negative situation (e.g., loss of a friend) or change internal focus to something irrelevant to the situation to decrease the emotional impact, whereas others may use concentration strategies by focusing on specific features of an emotional situation (Gross, 1998). Within this component of the model, music therapists create music-based experiences that utilize singing, improvising, and movement to music so that older persons practice increasing attentional capacity by exercising sustained attention to sounds and actions within a therapeutic relationship (Jang, 2016b). Emotion regulation through optimal attentional control can be achieved through enhancement of sustained

attention that may involve sensory processing of music elements and "musical communication" between the client and the therapist (Swaine, 2014, p. 856).

If attentional focus is constantly directed toward negative feelings (i.e., rumination), it can have a detrimental effect on a person's psychosocial well-being (D'Hudson & Saling, 2010). However, older adults tend to seek emotionally meaningful situations due to limited life span, thus it may be beneficial to provide individual and/or group music experiences that direct older adults' attention to positive and emotionally meaningful circumstances rather than negative ones (Baltes & Baltes, 1990; Jang, 2016b).

Cognitive Stimulation. When an individual gains increased attentional capacities, Cognitive Stimulation, the third component of the MBER model is introduced. Cognitive Stimulation refers to "conscious efforts made to improve or maintain cognitive functions such as memory, concentration, reasoning, and decision-making" (Jang, 2016b, p. 13). Having high cognitive function is closely related to emotional well-being and an important marker for healthy aging (Fernandez-Prado, 2011; Payne et al., 2012; Rowe & Kahn, 1997; Woods, Aguirre, Spector, & Orrell, 2012). Despite negative perceptions about aging associated with cognitive decline, intellectual stimulation has a positive impact on maintaining cognitive performance in later life (Woods, Aguirre, Spector, & Orrell, 2012). Thus, Cognitive Stimulation attempts to challenge older adults at an intellectual level through active learning and reminiscence (Jang, 2016b).

Music requires complex sensory and cognitive processing of successive music elements such as rhythm and melody, which demands order, succession, and temporal relationship among the music elements. Cognitive Stimulation utilizes this cognitively demanding nature of music processing, and active learning is to preserve or maintain cognitive functioning of older persons in this component of the MBER model (Jang, 2016b).

Based on an individuals' musical background and cognitive ability, music therapists are encouraged to create an optimal learning environment in which older persons feel mutually respected, have the opportunity to actively participate in decision making processes (e.g., song selection) and clearly share motivation and strategies to learn new information (Reifinger, 2016). Also, it is important to create a learning environment in which older adults experience increased self-efficacy in memory as it impacts performance outcomes in goal-directed cognitive exercises (Payne et al., 2012; Roulston, Jutras, & Kim, 2015).

Social Interaction. After experiencing cognitively challenging yet mood enhancing music engagement, older adults are introduced to the most complex area of the MBER model, Social Interaction. Social Interaction is about actions shared by two or more people and serves as a critical protective factor against depression (Jang, 2016b). In this social component of the MBER model, music functions as a medium that naturally encourages building meaningful relationships and creating a social outlet through which older persons engage in reciprocal music interactions characterized by shared symbolic expressions of and discussions about emotional adversities that encourage empathy, interpersonal emotion regulation, sense of belonging, and acceptance of self.

Music therapists can facilitate these reciprocal music interactions by having clients share the same musical contexts through mirroring of one's emotional expressions and mimicking expressive musical cues to build social support as a bottom up approach. Individuals with depression often experience negatively biased emotion (Eerola & Vuoskoski, 2013); thus, older adults may achieve emotional clarity by articulating what was experienced during the emotional expression through music in a group environment where empathy is shared. Also, they may reappraise current emotional challenges through the presence of others and eventually achieve decreased depressive symptoms as a top-down approach.

Additionally, music therapists are encouraged to create music-based reminiscence experiences in which older adults' life experiences and memories are shared and validated in social context. Music-based reminiscence was placed under Cognitive Stimulation when the MBER model was originally constructed (Jang, 2016b). However, after careful examination of the nature of each component of the MBER model, the author modified the model and matched music-based reminiscence with Social Interaction, not with Cognitive Stimulation as reminiscence experience is more closely related to interpersonal emotion regulation than intellectual stimulation in the client context that the model targets (i.e., typically aging older adults with depressive symptoms).

Neurological Underpinnings of Emotion Regulation and Music.

In an attempt to make a parallel relationship between non-musical behavior (i.e. emotion regulation) and musical behavior (i.e., music listening and instrument playing), Jang (2016b) synthesized literature that identified brain areas that are associated with emotion regulation and music experiences that activate those brain areas. Emotion regulation is characterized by increased activation in cognitive controlling and monitoring areas such as anterior cingulate cortex (ACC), orbitofrontal cortex (OFC), and lateral prefrontal cortex (PFC) and decreased activation in areas associated with emotional reactivity such as the amygdala (Sena Moore, 2013). In other words, emotion regulation is the interplay between cognitive monitoring and controlling and emotional reactivity.

In a systematic review of literature focusing on neural substrates of music on emotion regulation, Sena Moore (2013) synthesized outcomes found in neuroscience literature that includes fMRI, PET, and EEG studies and identified music experiences that activate the aforementioned areas associated with emotion regulation. According to this systematic review, when individuals listen to pleasant or happy music, they experience an increased

activation in the anterior cingulate cortex (ACC), orbitofrontal cortex (OFC), and prefrontal cortex (PFC), and decreased activation in the amygdala (Blood & Zatorre, 2001; Jang, 2016b; Koelsch, 2014; Koelsch, Fritz, Cramon, Muller, & Friederici, 2006; Limb & Baun, 2008). Similar activation patterns were reported when listening to music, regardless of the emotional meaning to the listeners, and when singing and improvising (Sena Moore, 2013).

Listening to pleasant or happy music and engaging in musical improvisation share the same brain areas associated with emotion regulation. Therefore, evidence suggests a parallel relationship between emotion regulation and music and such music engagement has the potential to function therapeutically in emotion regulation processes (Jang, 2016b). This parallel relationship provides neurological support from basic science research for the MBER model (de L'etoile, Dachinger, Fairfield, & Lathroum, 2012).

Review of Existing Interventions and Measurement Tools

According to the preventive intervention research cycle illustrated in Figure 2, reviewing interventions both inside and outside prevention research is a necessary step in developing preventive interventions (IOM, 1994). In this section of the chapter, the author reviews evidence-based non-music approaches that target depression treatment and prevention as well as music approaches that aim to decrease depressive symptoms in older adults. Preventive programs target individuals who are at risk of developing a clinically significant disorder; thus, the author describes measurement tools that allow screening of such individuals as well as evaluation of intervention outcomes. These described tools have been tested for reliability, validity, sensitivity, and specificity.

Non-music approaches. The CDC and the National Association of Chronic Disease Directors (NACDD) recognizes the importance of increasing public awareness that depression can be effectively treated through community-based programs and introduces

evidence-based depression treatment programs (CDC, 2008). The following three programs are recommended by the CDC and NACDD, and have been successfully replicated in community settings: Program to Encourage Active, Rewarding Lives for Seniors (PEARLS), Improving Mood-Promoting Access to Collaborative Treatment (IMPACT), and Healthy IDEAS (Identifying Depression, Empowering Activities for Seniors).

PEARLS is a home-based depression treatment intervention that uses problem-solving treatment (PST), social and physical activation, and pleasant event planning and scheduling (CDC, 2008). PST is based on a premise that systematically identifying and addressing problems that individuals face in everyday lives can lead to decreased depressive symptoms (Ciechanowski et al., 2004). In the PEARLS intervention, social activation was facilitated to help older adults experience social interaction outside home, and group activities that encourage peer support were given the highest priority. Physical activity was also organized to help participants engage in a regular physical activity program that was guided by national recommendations. The intervention consisted of eight 50-minute sessions over 19 weeks followed by subsequent telephone contacts. To determine the effectiveness of the PEARLS intervention, Ciechanowski et al. (2004) conducted a randomized controlled trial with older adults with minor depression or dysthymia and found that the group who received the treatment experienced at least a 50% reduction in depression symptoms compared to a group who received usual care. Additionally, 36% of the treatment group achieved complete remission and a significant group difference was reported on functional and emotional well-being.

IMPACT is a team-based collaborative depression treatment intervention that targets older adults with major depression or dysthymia in primary care settings. IMPACT is characterized by education, behavioral activation such as physical activity and activity

scheduling, and relapse prevention for those who show symptom reduction. In a randomized controlled trial, Hunkeler et al. (2006) provided the IMPACT intervention to older adults from 18 primary care clinics and reported that treatment groups showed significantly better results in depressive symptoms, continuation of antidepressant treatment, physical functioning, quality of life, self-efficacy about confidence in managing depression, and satisfaction with care. Also, the researchers reported that the result of the IMPACT intervention persisted at least one-year post completion of the intervention.

Healthy IDEAS is another community-based program designed to detect and decrease depressive symptoms among elderly yet differs from PEARLS and IMPACT in that the intervention was provided by case managers in community agencies, not by mental health professionals trained solely for implementation of an intervention. The intervention included education (e.g., role of meaningful activities and self-care strategies), assessment of mood, identification of activities that fit with an individual's life values in various domain areas, and monitoring of an individual's progress implementing activity goals. Quijano et al. (2007) investigated the effectiveness of the intervention with high risk community-dwelling older adults and reported a significant reduction in depression and pain severity, positive changes in mood, and increased knowledge about how to get help for depression even after six months of receiving the program. However, generalizability was limited due to lack of control group.

All three evidence-based programs described above share qualities that seem important to intervention success. These qualities are that (a) all three community-based interventions used behavioral activation, which reflects the fact that the cognitive behavioral approach is the most commonly used form of depression treatment targeting older adults; (b) intervention delivery was adhered to based on a treatment manual to ensure fidelity; (c) education about depression and how to successfully practice new skills was provided at the

initial phase of intervention delivery; (d) follow-ups were done through various forms such as telephone communication and relapse prevention; and (e) collaboration among various entities such as program providers, case managers, psychiatrists, and community agencies seemed to play a crucial role in participant recruitment, intervention delivery, and successful implementation of the interventions (Ciechanowski et al., 2004; Hunkeler et al., 2006; Quijano et al.,2007).

In a preventive framework, indicative interventions that are oriented in the cognitive-behavioral approach, life review, and psychosocial interventions have shown intervention effectiveness. The author reviewed four types of preventive interventions that showed promising results: Stepped-Care, Coping with Depression (CWD), Looking for Meaning, and various psychosocial interventions that were reviewed by Forsman, Schierenbeck, and Wahlbeck (2011). Stepped-Care, CWD, and Looking for Meaning are preventive approaches that have shown intervention efficacy in preventing late-life depression and are recommended by the CDC for community-based use. Forsman, Shierenback, and Wahlbeck (2011)'s synthesis of psychosocial interventions describes elements that seem to contribute to positive outcomes associated with decreased depressive symptoms.

Stepped-Care is an indicated preventive intervention that focuses on cognitive-behavioral techniques that are characterized by four steps of care: watchful waiting, brief cognitive behavior therapy-based bibliotherapy (i.e., planned reading program with a specific therapeutic purpose), cognitive-behavior therapy-based PST, and referral to a primary care physician (van't Veer-Tazlaar et al., 2009). In the initial phase, individuals with subthreshold depressive symptoms were selected over a three-month period to exclude those whose symptoms disappear spontaneously (i.e. watchful waiting). A trained nurse provided cognitive behavior therapy based bibliotherapy and offered information about a depression

and anxiety self-help course that was designed to help older adults improve social skills, address thought patterns, and increase pleasant activities and relaxation to better cope with depressive symptoms. Trained nurses also provided brief cognitive behavioral therapy based PST that focused on practical skill building to help individuals regain control over their lives. Fidelity was monitored through tape recording. In the last step, individuals who continued to show an elevated depression score were monitored and received written advice to discuss with primary care physicians. The Stepped-Care intervention decreased the incidence of depressive and anxiety disorders by half, suggesting that indicated interventions such as the Stepped-Care preventive intervention can be effective in reducing the risk of developing depression in older persons.

Coping with Depression (CWD) is a highly structured cognitive-behavioral approach that focuses on psychoeducation (Lewinshon, 1975). An important characteristic of the CWD is that participants learn a series of skills that may help them to cope with depressive symptoms through social skill building and cognitive reconstruction. In the CWD intervention, participants play an active role in collecting information on the subject matter (i.e., negative thought, pleasant/unpleasant events, and social events), setting a goal, and developing a systematic plan to reach the goal (Cuijpers, Munoz, Clarke, & Lewinsohn, 2009; Lewinsohn, 1975). Efficacy of the CWD intervention has been tested in many studies in diverse populations and settings and among those, Cuijpers et al. (2009) reported that individuals who received the CWD showed 38% less chance of developing a depressive disorder than who were in the control group. Psychoeducation can be delivered through various forms including books, media, individual/group or self-help format. More recently, internet-based CWD intervention was delivered to older adults with subthreshold depression

and showed intervention efficacy as well as carry-over effect one-year post intervention implementation (Spek et al., 2008)

Based on the premise that reminiscence serves three major functions: self-functions characterized by coherence, meaningfulness, and continuity of the self; guidance characterized by shared and recalled knowledge and experience; and intrinsic link to emotions characterized by interpersonal emotion regulation (Cappeliez, O'rourke, & Chaudhury, 2005), Pot et al. (2010) conducted an indicated preventive intervention called, Looking for Meaning. Looking for Meaning is a structured reminiscence intervention that includes sensory recall exercises (i.e. smells from the past), creative activities, and verbal discussion. The results showed that older adults with subsyndromal depressive symptoms experienced significant reduction in depressive symptoms and the symptom reduction was retained during six months follow-up post treatment.

Forsman, Schierenbeck, and Wahlbeck (2011) conducted a systematic review of the literature that examined the efficacy of psychosocial interventions within the preventive framework. Synthesis of these results indicated that interventions that focused on social activities in which older adults had an active role in meaningful social involvement tailored to individuals' abilities, preferences and needs showed statistically significant results. Psychosocial interventions that were relatively longer with more frequent delivery than a few weeks also showed significant outcomes in decreasing depressive symptoms.

In summary, interventions that have shown effectiveness in decreasing depressive symptoms of older persons in treatment and prevention involve cognitive behavioral approaches that are characterized by active participation in goal setting and problem solving, psychoeducation regarding how to strategically solve the problem, and social skill building that involves peer support. Reminiscence interventions that focus on meaningfulness through

interpersonal emotion regulation, and psychosocial interventions in which individual values and needs are taken into consideration in meaningful social activities have also shown promising results in addressing depressive symptoms in older persons.

Music approaches. Theoretical mechanisms of how music, particularly music listening, may induce emotions of a listener have been studied in music psychology and music therapy (Juslin & Slobada, 2010; Slobada & Vastfjall, 2008; Thaut, 2005). However, how music interventions may address emotional needs of the older adult population has not been well defined; thus, Jang (2016a) conducted a systematic review summarizing and synthesizing characteristics of music-based interventions, emotion related goals, and population profiles.

According to this systematic review (Jang, 2016a), depressive symptoms were the most frequently addressed outcomes in the emotional domain for older adults with all studies that addressed depressive symptoms reporting statistically significant symptom reduction. Interventions identified in this systematic review included combinations of various types of traditional music experiences such as singing, instrument play, listening to music, and music-based reminiscence. The majority of interventions used music that was familiar to and/or preferred by participants. Interesting findings in the systematic review were that (a) 88% of reviewed studies were conducted in international locations including South Korea, Singapore, and Germany; (b) 88% of identified studies were completed with patients with dementia; and (c) although all studies included in the review reported positive emotional outcomes, poor intervention reporting and lack of details of the specific characteristics of music made it difficult to understand and evaluate the music interventions delivered to older adults for the purpose of addressing emotional needs.

Among these music interventions delivered by credentialed music therapists, the following is an overview of the intervention studies that specifically focused on depressive symptoms of older adults that have shown intervention efficacy. The majority of these interventions targeted patients with dementia and they were conducted in international locations. Although it is hard to find a general pattern due to the heterogeneity in population characteristics, these studies may provide emerging evidence and intervention characteristics that support the use of music in the context of depressive symptom reduction in the older adult population (see Table 3 for a summary of the following reviewed articles).

Ashida (2000) conducted a music-based intervention that primarily focused on reminiscence with patients with dementia in two residential facilities in Canada for three weeks and found a significant decrease in depressive symptoms. Similarly, Choi, Lee, Cheong, and Lee (2009) conducted a small-scale intervention study with patients with dementia in a day care unit in South Korea and used various music experiences such as instrument play, movement to music, and music listening. Despite poor intervention reporting, the study showed positive outcomes in reducing depressive symptoms.

Han et al. (2010) conducted a multi-componential intervention called Music Therapy and Activities Program that included a combination of music experiences, exercise, and gardening in individuals with dementia in an outpatient dementia clinic in Singapore. After receiving weekly, six-hour sessions for eight weeks, the participants showed significant decreases in depressive mood and behaviors.

Raglio et al. (2015) conducted a randomized controlled trial on patients with dementia in Italian nursing homes. The researchers compared active music therapy characterized by singing and instrument improvisation, music listening characterized by listening to music from preferred song lists without interaction with a therapist or a caregiver to control, and

standard care group who received educational, occupational, and physical activities. All groups showed significant changes in depression symptoms but no significant group differences were found among the three groups.

Chu et al. (2014) modified a previously developed intervention protocol and conducted a randomized controlled trial of 104 older adults with dementia from three nursing homes in Taiwan. The intervention included music and movement, instrument play, listening to popular music, singing, and music-guided reminiscence, and reported improvements in depressive symptoms as well as cognitive functions.

Mohammadi, Shahabi, and Panah (2011) conducted an intervention study with patients with dementia in a nursing home in Iran and used classical as well as traditional instruments (i.e., Daf, Tombak) in various music experiences. Popular songs and theme-based songs that focus on emotions were also utilized in the intervention delivery. After receiving a 10-week set of music therapy sessions, the researchers reported significant decreases in depression and anxiety scores in the intervention group when compared to the controlled group.

Hanser and Thompson (1994) provided home-based music therapy that specifically focused on music listening, guided imagery, and relaxation in the US. Participants were randomly assigned to either music listening group in which individuals received eight, one-hour weekly home visits or to the self-administered music therapy group in which participants engaged in daily music listening at participant chosen times and a weekly 20-minute telephone conversation with the therapist. Both groups differed in depression scores from the wait list control but no differences were found between home-based and self-administered conditions.

In summary, despite lack of transparent reporting of intervention characteristics, engaging in music experiences - including active music therapy and music-based reminiscence - has shown positive results in decreasing depressive symptoms in diverse settings across cultures. Also, the reviewed studies suggest that listening to music that is tailored to individual preference and self-administered music listening can be used as viable emotion regulation strategies in reducing depressive symptoms of older adults.

Table 3

Summary of the Reviewed Articles using Music Approaches Adapted from Jang (2016a)

Author	Study design	Participant characteristics	Duration/ frequency of interventio n delivery	Types of music experiencesex experiences	Description of music	Outcomes	Measures
Ashida (2000)	1-group pre-posttest design	20 individuals with dementia (73-94 yr; M=86.2 yr) in two residential care facilities in Canada	Sessions facilitated at the participants' residential settings Sessions were provided for 3 weeks. Average duration of each session: 42.95 minutes	Group MT (4 interventioninterventio n groups total) Reminiscence (primary component) Drumming Singing	InstrumentS: 1 classical acoustic guitar, 1 small African drum Songs: collection of songs from the period between 1890s and 1930s; and familiar songs related to the theme of the day	Significant decrease in depressive symptoms after receiving 5 days of reminiscenc e focused MT sessions Observation data showed significant mood improveme nt right after MT sessions.	Cornell Scale for Depression in Dementia Behavioral observation
Choi, Lee, Cheong, & Lee (2009)	2-group non-randomized design	20 patients with dementia (62.7-83.7 yr; M=74.9 yr) in a special dementia day care unit in South Korea	50 minute music intervention was provided 3 times a week for 5 consecutive weeks	Instrument play Movement Singing Making simple instruments Listening to songs	No detailed description about music characteristics	Depressive symptoms significantly improved in the music intervention group Significant improvement in depression, anxiety, and irritability with regard to caregivers' distress	Mini-Mental State Examination Geriatric Depression Scale Geriatric Quality of Life Neuropsychiatri c Inventory-Questionnaire
Chu et al. (2014)	2-group randomized controlled trial	104 older adults with dementia (65 yr or above) from three nursing homes In Taiwan	30 min sessions were provided 2 times a week for 6 weeks	Group MT Protocol: modified version of Clair & Berstein (1990) Music and movement Instrument play	Instruments: triangles, clappers, maracas, handbells, and tambourines Music	Improvements in depressive symptoms after music intervention No significant	Chinese version of the Cornell Scale for Depression in Dementia Mini-Mental State Examination

				Listening to popular music Singing with instrumental accompaniment Music-guided reminiscence	choice was related to traditional festival	differences on salivary cortisol level between experimental and control groups Improvement in cognitive functions with persons with mild and moderate dementia	Salivary cortisol level
Han et al. (2011)	2-group non-randomized wait-list control trial	43 individuals with dementia (69.4-87.6 yr; mean=78.3 yr) from an outpatient dementia clinic in Singapore	A weekly, 6 hour MT session delivered for 8 weeks	Group MT (8 individuals in a group) Music Therapy and Activities Program (MAP) included music, exercise, gardening, horticulture, and reminiscence Music experience included singing, music and movement, and instrument play	No detailed description about music characteristics	Depressive mood and behaviors significantly decreased after intervention	Apparent Emotion Scale-Revised Memory and Behavioral Problems Checklist
Hanser & Thompson (1994)	3-group randomized waitlist control trial	30 older adults (61-86 yr; mean=67.9 yr) diagnosed with major or minor depressive disorder	Home-based MT group: received one-hour 8 weekly home visits Self-administered MT group: Daily music listening at a participant chosen time and weekly 20 minute phone conversations	Music listening protocol included progressive muscle relaxation, guided imagery, deep relaxation, and listening with other art forms	Energetic music Relaxing music Slow and repetitive music Rhythmic music	Two music conditions on all measures differed from the wait list control. No difference was found between home-based and self-administered conditions	Geriatric Depression Scale Brief Symptom Inventory Self-Esteem Inventory Profile of Mood States-Bipolar Form
Mohammad, Shahabi, & Panah (2011)	2-group randomized controlled trial	19 elderly (>65 yr; M=69.47 yr) in a nursing	Daily 90 minute sessions for 10 weeks	Group MT Listening to music Singing	Classic and traditional instruments (i.e., Daf,	Significant decrease in anxiety, stress, and	Depression and Anxiety Stress Scale

		home in Iran with illnesses ranging from dementia to chronic physical disease		Instrument play Movement to music Reminiscence, Visualization	Tombak, Maracas) Popular songs Songs about fears, hates, and worries Singing romantic poems	depression reported in the intervention group	
Raglio et al. (2015)	3-group randomized controlled trial	120 patients with moderate to severe dementia (73.4-89.2 yr) and psychological symptoms living in 9 Italian nursing homes	Active MT group: 20 individualized 30 minute MT sessions Music listening group: twice a week listening sessions were provided for 10 weeks	Active MT group: singing and instrument improvisation Music listening group: preferred playlist without interaction with a therapist or a caregiver Standard care group: educational, occupational, and physical activities	Melodic and rhythmic instruments Emotional expression and modulation through singing and instrument play	All groups showed significant improvement over time in behavioral and psychological symptoms including depression and quality of life but no significant group differences were found among the three groups	The Neuropsychiatric Inventory Cornell Scale for Depression in Dementia Cornell-Brown Scale for Quality of Life in Dementia Music Therapy Check List-Dementia

Standardized measurement tools. Although there is a plethora of measurement tools, the best screening tool is one that accurately differentiates those individuals with and without depression (Berman & Furst, 2010). Besides just evaluating validity and reliability, one must consider sensitivity and specificity when determining which screening tools are appropriate for chosen participants (Berman & Furst, 2010). A measurement tool that has good sensitivity is one that correctly identifies individuals with depression whereas a measurement tool that has good specificity is one that correctly identifies individuals without depression (Lewinsohn, Seeley, Roberts, & Allen, 1997). The following are screening tools that have been widely used in mental health research and clinical practice with tested sensitivity and specificity. Summary of the depression tools can be found in Table 4.

Center for Epidemiologic Studies Depression Scale (CES-D). CES-D is a 20-item measure that asks individuals to rate depressive symptoms in five psychometric categories of depressed mood, feelings of worthlessness, feelings of hopelessness, loss of appetite, poor concentration, and sleep disturbance. The CES-D provides a cut-off score that helps identify individuals who are at risk of developing depression (Lewinsohn, Seeley, Robers, & Allen, 1997; Radloff, 1997). The CES-D is the most widely used depression screening instrument in community-based studies (Gotlib & Cane, 1989). It is a short screening tool and it takes about ten minutes to complete and is available in multiple language formats that include Korean, Japanese, and Spanish (Berman & Furst, 2010). However, the CES-D has limitations in that (a) studies show mixed results in demonstrating its reliability and validity; (b) the tool does not include assessment of suicidality; and (c) it focuses on symptoms that were present only during the past week.

Geriatric Depression Scale (GDS). GDS is a popular measure used to screen depression in the elderly population (Yesavage et al., 1983). The GDS has a 30-item

questionnaire and provides force choice response (yes/no) that requires little cognitive involvement (Lopez, Quan, & Carvajal, 2010). GDS can be self-administered or used as an interview. More recently, a 15-item version of the GDS (GDS-15) demonstrated its overall effectiveness in detecting elderly with depressive symptoms in the community (Conradsson, et al., 2013; Shoevers et al., 2006). The GDS is useful in monitoring changes in symptoms over the course of treatment and is available in 28 different languages including Korean, German, and Spanish. This tool is in the public domain; both long and short formats, as well as different versions based on language choice, can be found from Aging Clinical Research Center at the Stanford University (see at http://web.stanford.edu/~yesavage/GDS.html). The tool has undergone rigorous testing and has shown excellent reliability, validity, and high sensitivity (Ertan, Ertan, Kiziltan, & Uygucgil, 2005; Malakouti, Fatollahi, Mirabzadeh, Salavati, & Zandi, 2006; Sheikh & Yesavage, 1986). One limitation of the GDS is that it involves symptom experiences within the past week and lacks inclusion of questions related to suicidal ideation (Berman & Furst, 2010).

Patient Health Questionnaire (PHQ-9). PHQ-9 has nine questionnaires that directly respond to nine symptoms specified in the DSM-IV and can be used for screening as well as for reporting treatment efficacy (Chen, Huang, Chang, Chung, 2006; Kroenke & Spitzer, 2002; Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004). A shorter version, PHQ-2, is also available in cases where there is a need for screening a large number of people with few resources. PHQ-9 is available in more than 25 languages. Strengths of this tool lie in its (a) good overall sensitivity and specificity; (b) multiple formats of administration such as face to face and telephone interviews, and self-administration; (c) utility in both assessment and treatment; and (d) inclusion of questions related to suicide (Berman & Furst, 2010). Although

it requires permission to use, PHQ-9 is also in the public domain and is available at the Mapi Research Trust (see https://eprovide.mapi-trust.org/instruments/patient-health-questionnaire).

Beck Depression Inventory (BDI). BDI was originally designed to be administered by health care professionals but it has evolved as a self-administered instrument (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). One strength of this tool is that it not only provides the cut off score for varied levels of depression but also differentiates different subtypes of depression such as major depressive disorder and dysthymia (Berman & Furst, 2010). The BDI is a short screening tool that can be completed within 5-10 minutes.

Table 4

Summary of Measurement Tools Used to Screen Depressive Symptoms in Older Persons

	CES-D	**GDS**	**PHQ-9**	**BDI**
Description	20 item measure Mostly widely used in community-based studies Available in multiple languages	30 item measure Self-administered or used as an interview Force choice response (yes/no) Requires little cognitive involvement A shorter version, GDS-15 is available Available in multiple languages	9 item measure 9 items directly related to symptoms in DSM-IV A shorter version, PHQ-9 is available in multiple languages	21 item measure Self-administered A revised version, BDI-Ⅱ (i.e. revised version) is available
Strengths	Provides cutoff scores that help identify individuals who are at risk for clinical depression Short and can be completed within 5-10 minutes. Has good sensitivity and specificity with high internal consistency	Useful in monitoring changes in symptoms Undergone rigorous testing Excellent reliability, validity, sensitivity Public domain	Good overall sensitivity and specificity Multiple formats of administration (i.e., phone interview, self-administration) Inclusion of questions related to suicide Public domain	Provides the cutoff score for varied levels of depression Differentiates subtypes of depression Can be completed within 5-10 minutes
Limitations	Mixed results in reliability and validity Suicidality is not measured Focuses on present symptoms only during the past week	Involves symptoms experienced within the past week No inclusion of questions related to suicidal ideation	High false negative rates (i.e., limitation in detecting clinical cases)	Reliance on physical symptoms may inflate scores due symptoms of the illness
Access	http://www.chcr.brown.edu/pcoc/cesdscale.pdf	http://web.stanford.edu/~yesavage/GDS.html	https://eprovide.mapi-trust.org/instruments/patient-health-questionnaire	https://www.bmc.org/sites/default/files/For_Medical_Professionals/Pediatric_Resources/Pediatrics__MA_Center_for_Sudden_Infant_Death_Syndrome__SIDS_/Beck-Depression-Inventory-BDI.pdf

Notes: CES-D = Center for Epidemiologic Studies Depression Scale, GDS = Geriatric Depression Scale, PHQ = Patient Health Questionnaire, BDI = Beck Depression Inventory

In summary, prevalence of late-life depression is rising as the world population experiences unprecedented growth in the number and proportion of the elderly. Depression in older persons is a result of dynamic interplay of various biological, psychological, and social factors; thus, interventions that address these factors that contribute to maladaptive emotion regulation in older adults who are at increased risk of developing depression may decrease depressive symptoms. In addition, music has shown potential to be used as a viable emotion regulation strategy in theoretical and basic science research as well as efficacy trials. Among these, the MBER model provides theoretical conceptualization of how music may be used in emotion regulation processes in the context of depression prevention in older adults. Therefore, the author created an intervention manual to articulate an intervention based on the MBER model. This intervention manual was developed by following a series of intervention and manual development processes using theory-based music selections situated within the phases of the author's established research line.

CHAPTER III

METHOD

Although no universal set of approaches exist in intervention research in music therapy or related areas, assorted trial and error experiences have led to an improved understanding about what makes effective interventions. Therefore, researchers in the field should be encouraged to not repeat the mistakes of their predecessors by conducting intervention studies that may lead to compromised outcomes resulting from poor intervention design and lack of clarity in identifying pathways to behavioral changes. In this chapter, the author describes characteristics that make effective interventions that were then used to guide decision-making processes throughout the development of an intervention manual. The author outlines the systematic process of developing such a manual by aligning steps of the Preventive Intervention Research Cycle (IOM, 1994) with the Stage Model of Manual Development (Caroll & Nuro, 2002). To inform the types of music experiences that should be used in intervention research and subsequently delineated in the manual, as well as detailed planning of how music should be selected and used within the MBER framework, the author uses the Therapeutic Function of Music plan (Hanson-Abromeit, 2015). In the last section of this chapter, the author presents phases of the intervention research using the MBER theoretical model that guided this manual development and will direct future research.

Characteristics of Effective Interventions

Intervention research has evolved tremendously over the past 50 years targeting what is and is not effective. Some limitations of the initial efforts in intervention research were misalignment between the intervention intent and study outcomes, too simplistic an approach with a heavy emphasis on providing education materials, and a lack of contextual consideration (Caroll & Nuro, 2002; Gitlin & Czaja, 2015). However, recent advancement in

intervention research may decrease ambiguity in development, implementation, and evaluation of an intervention, and subsequently contribute to the provision of impactful interventions at an individual level, reduction of public health cost at a societal level, and a decreased knowledge gap between research and clinical practice at a professional level. To this end, Gitlin and Czaja (2015) discussed current knowledge about intervention research that may have important implications for music therapy research and clinical practice:

> *Although there is no universal or agreed upon set of approaches, practices, designs, or strategies, the collective knowledge, experience, and empirical evidence as to what works and what does not work in conducting behavioral intervention research is being amassed. For example, we know how to align theory with intervention development, use epidemiologic findings to identify intervention targets, involve communities and stakeholders in developing and implementing interventions, evaluate who benefits the most from interventions, embed interventions in practice settings and evaluate effectiveness using sophisticated adaptive designs and analytic techniques, and monitor and measure the impact of treatment adherence on treatment outcomes, Further, we now have experience standardizing intervention protocols, developing treatment manuals and training protocols, and conducting multisite and pragmatic trial designs that can potentially accelerate knowledge generation and its transfer to broad real-world settings (p. 6)*

Gitlin and Czaja (2015) clearly present characteristics of effective interventions based on the insights gained throughout the trial and error experiences. Therefore, the author used their conceptualization of what makes impactful interventions to guide each step of MBER intervention manual development. Table 5 describes characteristics of effective and ineffective approaches according to Gitlin and Czaja (2015).

Table 5

Characteristics of Effective and Ineffective Intervention Approaches
Source: Gitlin and Czaja (2015)

Effective Approaches	Ineffective Approaches
✓ Grounded in theory	✓ No theoretical basis for intervention development
✓ Multicomponent through which different strategies are used to address identified problem area	✓ Focus on a singular aspect of a complex set of factors contributing to the identified problem area
✓ Multimodal through which different pathways are identified to target problem area	✓ One pathway is targeted when multiple factors contribute to the existing problem
✓ Strategies are targeted by participant needs and cultural preferences	✓ "One size fits all" approach
✓ Participant-centered that clients' perspectives are integrated and self-identified needs are addressed	✓ Prescriptive and didactic approaches that do not reflect participant perspectives
✓ Participants are actively engaged in problem solving	✓ Participant needs are assumed a priori
✓ Flexible delivery characteristics based on settings	✓ Fixed dose and intensity
✓ Outcomes are closely aligned with intervention intent	✓ Outcomes are not closely related to intervention intent
✓ Intervention is oriented toward building skills to bring about positive behavior changes	✓ Too much focus is put on education when the intent is to change behavior
✓ Participant inclusion criteria reflects intervention intent	✓ Mismatch between participant inclusion criteria and intervention intent
✓ Involving end-users and/or stakeholders in the intervention development	✓ No consideration of the participant and/or stakeholders early in the intervention development process

Developing Intervention Manuals

Interestingly, one of the very first treatment manuals came from a psychodynamic tradition in an attempt to decrease ambiguity in treatment and analytic processes. Greenson

(1967), in his classic book, *The Technique and Practice of Psychoanalysis*, expressed the need to define guidelines that should inform psychoanalytic treatment:

> *It is my opinion that despite the many difficulties involved, it is high time for a textbook on psychoanalytic technique. I have the impression that there is a great danger in allowing ambiguities, divergences, and deviations to be transmitted by word of mouth from training analyst to analysand, from supervising analyst to candidate, and from colleague to colleague, in private discussions without their being duly noted and recognized for what they are. The standard works on technique written by Fred, Glover (1955), Sharpe (1930), and Fenichel (1941), excellent as they are, are only outlines. They do not describe in sufficient detail what the psychoanalyst actually does when he analyzes a patient. As a result, for example, analyzing a resistance can mean one thing to one analyst and something astonishingly different to another, yet each may believe he is analyzing a resistance according to a classical psychoanalytic principle* (p. 1).

However, efforts to develop manuals for interventions grew mostly in the cognitive-behavioral tradition because it became frustrating for researchers and practitioners to see positive findings yet lack specificity in clinical techniques and therapeutic strategies with poorly measured processes and outcomes (Addis, 1997). Development of manuals was fueled by legislative reforms that required practitioners to provide interventions that have strong evidence bases (Fraser, Richman, Galinsky, & Day, 2009).

Developing manuals is a defining feature of intervention research (Fraser, Richman, Galinsky, & Day, 2009). Written manuals describe central elements that are supported by theoretical and pragmatic foundations and are thought to account for the intervention's effectiveness (Gearing et al., 2011). The central elements are aligned with intervention goals and strategies that often include an overview of topics, session by session content, intervention activities, and materials needed (Caroll & Nuro, 2002; Fraser & Galinsky, 2010; Gearing et al., 2011).

Intervention manuals are different from practice guidelines in that they contain more decision-making tools because they provide specific guides to clinical practice that describe a

problem, a program theory, practice objectives, and program content (Fraser, Richman, Galinsky, & Day, 2009). Intervention manuals function as a crucial intervention map that clearly delineates purpose, rules and procedures of a specific approach. Well-written treatment manuals are different from clinical textbooks in that more details are provided regarding the roles of therapists and clients (Castonguay, 1999).

Comprehensive intervention manuals that address important underlying risk factors help improve therapists' capacity to help clients in many ways because therapists can be better equipped with current knowledge that is associated with a clinical problem and symptoms related to the problem (Castonguay, 1999). The extent to which core components of interventions are delivered as intended can directly influence intervention efficacy and effectiveness; thus, manuals can be used as a tool that allows evaluation of faithful and consistent adherence to core intervention elements when fidelity criteria are clearly established at the initial phase of intervention development (Fraser & Galinsky, 2010; Gearing et al., 2011).

Furthermore, manuals have the potential to reduce the gap between research and clinical practice, a desire often expressed by clinicians and researchers in the field of music therapy (Else, 2015; Thompson, 2015). Manuals (a) allow transparent and detailed intervention reporting; (b) provide roadmaps in decision-making based on clearly articulated theories and/or empirical evidence; and (c) facilitate the transfer of promising interventions from research to clinical settings (Caroll & Nuro, 2002).

The intervention development process is incomplete "until an intervention is optimally efficacious and implementable with fidelity by practitioners in the community" and so is intervention manual development (Onken et al., 2014, p. 2). Developing manuals is an iterative process that requires continued efforts of revision and adaptation to improve the

quality and impact of an intervention (Castonguay, 1999). Thus, through this iterative process, as an intervention manual goes through its phases of development and refinement, the intervention becomes more rigorous and increases the potential to have high impact on public health (Onken et al., 2014).

As one goes through the iterative and recursive process of an intervention research cycle, manuals serve different functions at different times of developmental stages ranging from initial creation of intervention materials to the adaptation of materials for different settings. Caroll and Nuro (2002) proposed the Stage Model of Manual Development in which clear distinction is made regarding what researchers need to address throughout the intervention development process. Table 6 describes areas to be addressed at each stage of the Stage Model of Manual Development.

Table 6

Areas to Be Addressed in the Stage Model of Manual Development
Source: Caroll & Nuro (2012)

Stage	Areas to be addressed
1	Overview, description Conception of the disorder or problem Treatment goals Contrast to other approaches Specification of defining interventions Session contents General format (e.g., delivery format, frequency)
2	Elaborated rationale Trouble shooting Managing transitions (e.g., guidelines for clinical decision making) Nonspecific or common aspects of treatment (e.g., therapeutic alliance) Compatibility with other treatments Therapist selection, training, supervision Clinical care standards
3	Issues related to patient diversity Program diversity Implementation by therapists with diverse range of disciplines and experience (e.g., training and supervision)

Manual development is not a single event but rather a series of progressive stages, with each successive stage addressing more complex clinical issues (Caroll & Nuro, 2002). Therefore, manuals evolve and play different roles across various stages of intervention development (Caroll & Nuro, 2012). The author integrated the Preventive Invention Research Cycle developed by the IOM (1994) that was presented in Figure 2 of Chapter 2 and Caroll and Nuro's (2012) Stage Model of Manual Development that was presented here in Table 6 to align steps of preventive intervention research and the three stages of manual development. These two models clearly articulate and guide manual development in this initial juncture of intervention development and inform future research trajectory within the phases of intervention research using the MBER theoretical model. These two integrated frameworks are illustrated in Figure 4.

In Chapter 2, the author identified both problem and program theories, and reviewed risk and protective factors associated with late-life depression as well as existing interventions for emotion regulation in older adults. According to the steps of the Preventive Intervention Research Cycle described in Figure 2, the author executed Steps 1 and 2 as a research process of intervention development and presented a synthesis of the reviewed materials in the previous chapter. Step 3 includes designing, conducting, and analyzing pilot and replication studies that involve initial intervention designing, manual writing, and fidelity measure development (Onken, Blaine, & Battjes, 1997). Based on the knowledge framework gained in Steps 1 and 2, the intervention manual using the MBER model was developed and presented as the outcome of this dissertation.

In Step 3 of the Preventive Intervention Research Cycle, the primary role of manuals is to define the intervention in broad strokes to provide an overview of the intervention, justification for the intervention supported by problem and program theory, a description of

the theoretical mechanisms of change, the intent and goals of the intervention, unique features of the intervention compared to other existing methods, and specification of the intervention's defining characteristics (Caroll & Nuro, 2002). Other critical elements of this stage of manual development is identifying the intervention's overall structure including format (i.e., group vs. individual), intensity (i.e., frequency and length), level of flexibility, and detailed guidelines for major content areas (i.e., how to facilitate rhythm-based improvisation) to be addressed (Caroll & Nuro, 2002).

Step 4 of the Preventive Intervention Research Cycle is about designing, conducting, and analyzing large-scale trials based on previously pilot-tested interventions and to determine intervention efficacy and evaluate mechanisms of action and/or effective components of the intervention (Onken, Blaine, & Battjes, 1997). The primary purpose of manuals at this stage of manual development is to provide the basis for therapist training, reduce therapist effect in clinical efficacy trials, dismantle intervention elements, and/or link process to outcomes (Caroll & Nuro, 2002). Critical elements of manuals include guidelines for trouble shooting (i.e., managing clinical problems), a description of the relationship between common elements (i.e., therapeutic alliance) as well as elements that are unique to a specific intervention, an explanation of compatibility with other treatment methods, detailed specifications of therapist education, training, and supervision, and a clarification of provisions of standards for managing clinical issues (Caroll & Nuro, 2002).

Step 5 of the Preventive Intervention Research Cycle is about effectiveness trials and evaluation of "transportability" of interventions that may include determining intervention effectiveness with diverse populations and in varied settings, evaluating different methods of training therapists, and estimating cost effectiveness of the interventions (Caroll & Nuro, 2002, p. 397). Manuals in this stage of manual development function to help clinicians treat

diverse groups of clients after facilitating several clinical trials for a variety of populations. Informed guidance to therapists about how the intervention may be adapted or have limited flexibility is also provided in this final stage of manual development (Caroll & Nuro, 2002). For the purpose of this dissertation, the author followed the guidelines of Stage 1 of the Stage Model of Manual Development that are aligned with Step 3 of the Preventive Intervention Research Cycle presented in Figure 4. This manual includes an overview of the intervention, support through delineation of associated problem and program theory, the theoretical mechanisms of change, intent and goals of the intervention as a whole and of each session, and unique characteristics of the intervention when compared with other approaches. Overall structure, frequency and length of intervention delivery, level of flexibility, and detailed descriptions of session-by-session format and contents that are additional crucial elements of this intervention manual.

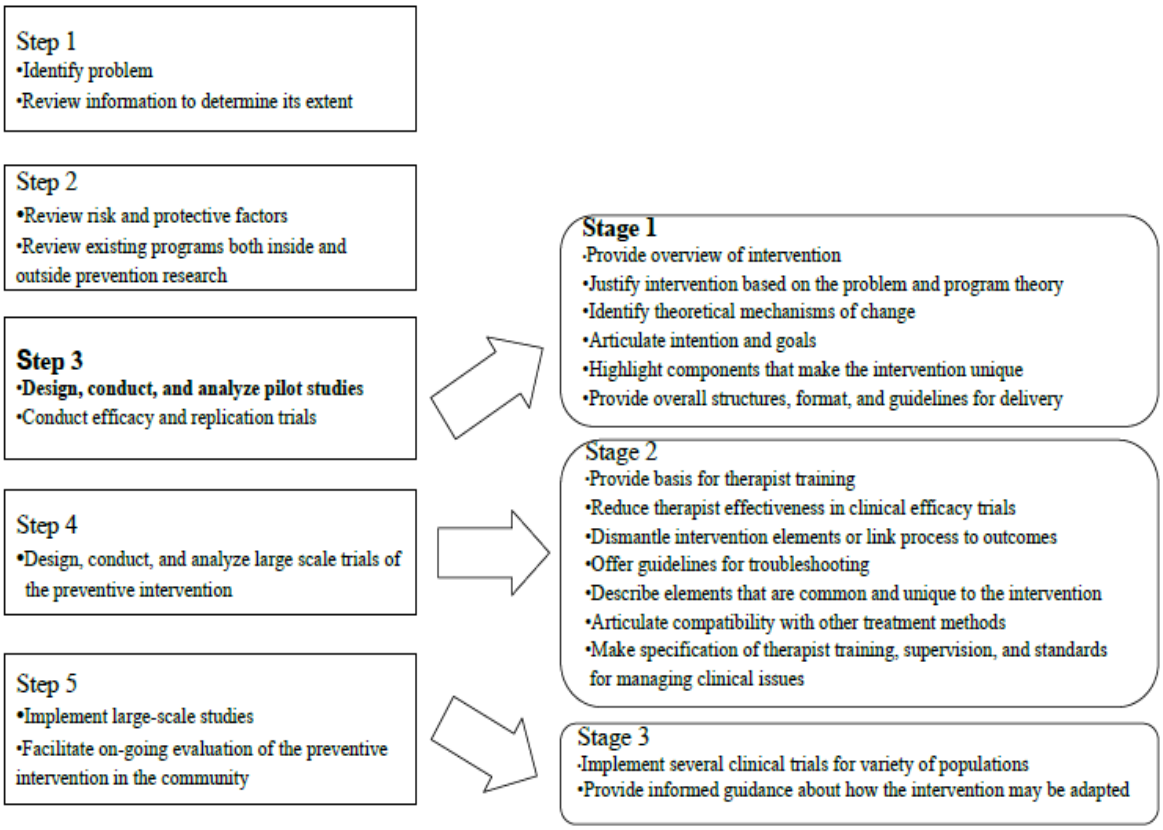

Figure 4. Integration of the Preventive Intervention Research Cycle (IOM, 1994) and the Stage Model of Manual Development (Caroll & Nuro, 2002)

Fidelity criteria was also established in this initial process of intervention and manual development because this plays an important role in evaluating how faithfully and consistently interventions are delivered according to the essential elements of the intervention (Fraser & Galinsky, 2010; Gearing et al., 2011). Gearing et al. (2011) provides a comprehensive intervention fidelity guide that includes four major components: designing, training, monitoring intervention delivery, and monitoring intervention receipt. Table 7 describes these four major components, the core categories that belong to each component, and the accompanying rating system. The author adapted Gearing et al. (2011)'s guidelines by modifying the major components on the basis of the current stage of manual development and adding sub-categories in each fidelity component. Each sub-category corresponds to the three-level rating system specified in Table 7.

Table 7

Comprehensive Intervention Fidelity Guide
Source: Gearing et al. (2011)

Design	**Training**	**Monitoring Intervention Delivery**	**Monitoring Intervention Receipt**	**Rating System (Points)**
Framework Establish training protocols Manual	Training protocols Supervision protocols Maintenance protocols Threats Measurements	Differentiation Intervention components Interventionist behaviors Rater standards Interventionist competence Monitoring drift Corrective feedback Threats Measurements	Protocols for dose received Participant comprehension Participant adherence Threats Measurements	Absent/Minimal (0) Moderate (1) Extensive (2)

Therapeutic Function of Music as a Guide for Music Selection

In Chapter 2, the author described a problem theory by identifying a phenomenon of interest and its scope (i.e., late-life depression and prevention), delineated the risk and protective factors associated with the phenomenon, articulated an intervention theory (i.e. MBER model), and reviewed existing interventions and related literature. On the basis of the problem and the program theory as well as knowledge gained through the process of reviewing relevant literature, the author aligned the Therapeutic Function of Music Plan with this information (Hanson-Abromeit, 2015). The TFM informed how music is to be selected, manipulated, and presented to facilitate therapeutic changes within the MBER theoretical framework.

Therapeutic Function of Music (TFM) is defined as "the direct relationship between the treatment goal and the explicit characteristics of the musical elements, informed by a theoretical framework and/or philosophical paradigm in the context of a client" (Hanson-Abromeit, 2013, p. 130-131). *The Therapeutic Function of Music (TFM) Plan* is a worksheet-based conceptual methodology that allows translation of knowledge into theory-based intervention delivery by breaking down 'music' into inherent music elements such as rhythm and melody, identifying theories that support the use of and functions of those music elements, and explicitly defining how each music element will be constructed, integrated, and delivered based on therapeutic goals and client contexts (Hanson-Abromeit, 2015).

In the course of this manual development, the TFM plan provided a theoretical basis of the use of each music element and its functions, and conveyed an explicit description of how each is to be selected and used. Ultimately, the author provided a synthesis of how each music element is to be used and gives meaning to the music as a whole under each component of the MBER-guided intervention. The TFM plan conceptualized within the

MBER model is presented in Table 9 and found at the conclusion of this chapter. It should be noted that the TFM plan was created based on the best available literature at the time of its creation and new research may modify the findings.

Phases of the MBER-guided Intervention Research and Future Plan

The author set long-term research goals that are articulated in five phases within her MBER-guided research agenda (see Figure 5). This five-phase research line is modified from the Preventive Intervention Research Cycle suggested by the IOM (1994) for it is the author's intention to apply the full spectrum of the Continuum of Care model by addressing all aspects of care structured around prevention, treatment, and maintenance of a clinically significant diagnosis (i.e. late-life depression). Additionally, it is the author's plan to develop the MBER-guided intervention into large scale studies with increased time efficiency by including tailored interventions that are culturally and clinically adapted as she goes through efficacy and effectiveness trials rather than going through the whole Preventive Intervention Research Cycle and transitioning toward clinical trials.

Currently, this manual development is in Phase 2 of the author's own research agenda, which will inform subsequent pilot and feasibility testing, and eventually efficacy trials. Prior to this current research phase, the author conducted a phenomenological study about older adults' participation in a community choir (Jang, 2015). This qualitative research study offered the conceptual basis for the development of the MBER model (Jang, 2016b) by providing a preliminary overview of the benefits of community-based music engagement on older adults' socioemotional health (Gilgun & Sands, 2012). Among numerous benefits articulated by the participants, the author paid special attention to how the older adults were using the choir participation as an intentional effort to regulate emotion, and developed a

theoretical model (i.e. MBER) that suggests how music can provide active emotion regulation strategies in community-based settings within the context of the older adult population.

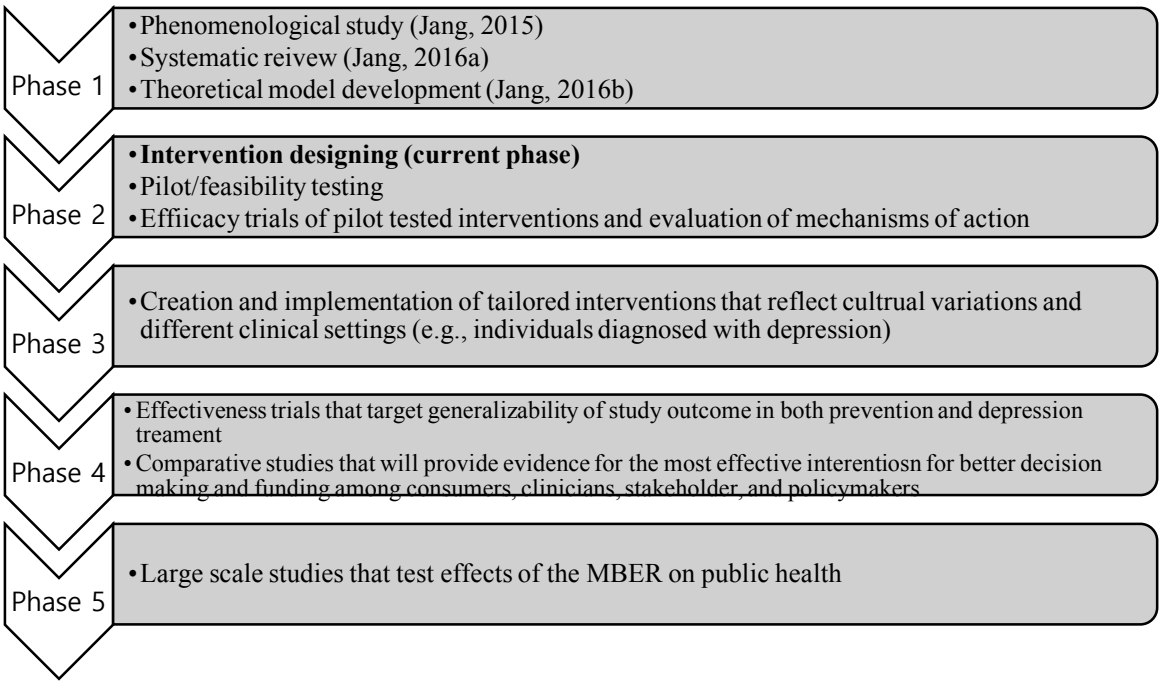

Figure 5. Phases of Intervention Research using the MBER model

In addition to this theory development, the author summarized and synthesized characteristics of music-based intervention studies that targeted emotional needs of older adults through a systematic review (Jang, 2016a) to inform intervention development in Phase 1 of her research line (Hanson-Abromeit & Sena Moore, 2014). Conducting the systematic review prior to this manual development helped the author gain insights into how music has addressed emotion regulation of older persons by identifying trends, strengths, and limitations of the reviewed studies.

When this intervention manual is ready to be tested in community settings in Phase 2, the author will conduct a pilot study to establish initial data and examine procedures that may include feasibility of recruiting participants with subthreshold depression (LaGasse, 2013).

With the pilot-tested intervention, the author will proceed to efficacy trials to test intervention efficacy and evaluate mechanisms of action (Melnyk, Morrison-Beedy, & Moore, 2012). In Phase 3, the author will tailor the intervention so that it can be adapted and implemented with cultural variation and in different clinical settings (e.g., individuals diagnosed with depression). Phase 2 and 3 may involve iterative processes of revision and modification due to crucial changes in participant characteristics and cultural variants and based on results gathered from additional research studies that have already been conducted.

In Phase 4 of the MBER-guided research line, the author will conduct effectiveness trials that target generalizability of study outcomes in prevention and treatment of depression in older adults. When these data are promising, effectiveness comparative studies involving other types of therapeutic modalities (e.g., cognitive behavioral interventions) will be performed, which may help consumers, clinicians, stakeholders, and policy makers make informed decisions about best available practices that fit their needs (Melnyk et al., 2012). It may take a significant amount of time to reach Phase 5 which targets large scale studies that examine intervention effects on public health and it may require considerable collaboration with other music therapists, researchers with related areas of expertise, and stakeholders in the community; yet, it is exciting and worthwhile to develop and advocate an intervention that has the potential to facilitate improved emotion regulation, prevent and treat depression in older adults, and subsequently lead to healthy aging and increased quality of life of older persons. Figure 5 depicts the potential progression of the MBER intervention research line articulated across the described five phases.

Overview of the MBER-guided Manual Development Process

Centered on the MBER model, Phase 2 of the author's research line (see Figure 5) is intervention design and testing. To this end, the author followed Step 3 (designing pilot

studies) of the Preventive Intervention Research Cycle (see Figure 2) that is informed by the knowledge framework established in Steps 1 and 2 of this same research cycle as articulated in Chapter 2. Stage 1 of the Stage Model of Manual Development (see Table 6) is aligned with Step 3 of the Preventive Invention Research Cycle and provides the foundation for what is included in the MBER-guided intervention manual as a component of Phase 2 of the author's research line. As a reminder, the author's alignment of the Preventive Intervention Research Cycle and the Stage Model of Manual Development is presented in Figure 4.

As illustrated in Figure 6, which depicts the *Overview of the MBER-guided manual development process*, this Stage 1 manual provides a *program overview* of the intervention by describing the intended population and setting, justifying the intervention based on both problem and program theory by directing the reader to relevant knowledge frameworks directly informed by Chapter 2 of the dissertation. These knowledge frameworks are reprinted in the initial material of the manual to provide literature support, and articulate overall procedures according to each component of the MBER model. *Theoretical mechanisms of change* are presented through a visual illustration that includes theory base, goals and objectives, key components, and intervention outcomes. Additionally, this manual presents an overall structure of the intervention by presenting an intervention *delivery schedule* that includes session number, relevant MBER strategy, frequency and duration, delivery format, and homework assignments.

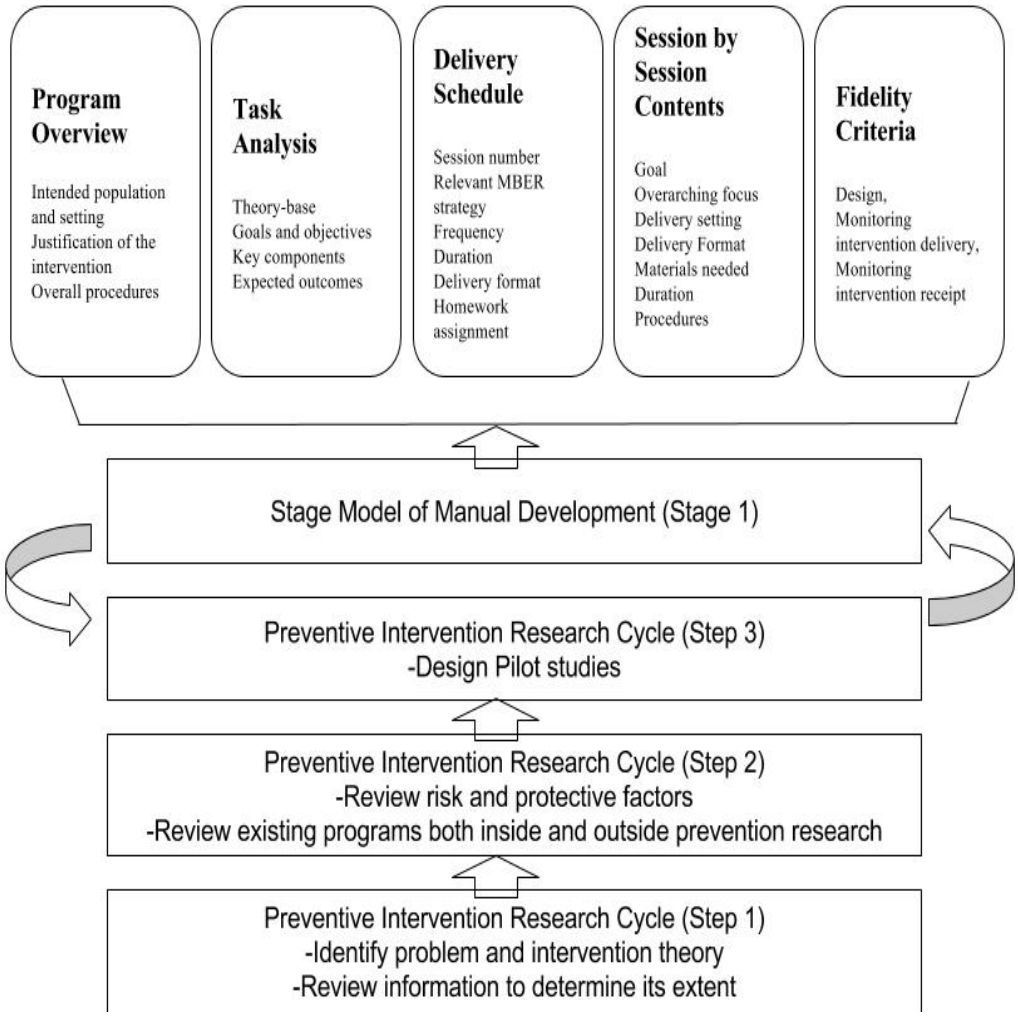

Figure 6. Overview of the MBER–guided manual development process

Session by session content was constructed based on the four modules derived from the four emotion regulation strategies suggested in the MBER model and includes the overarching focus, corresponding goals, delivery setting, delivery format, materials needed, duration, procedures, notes for the clinician, unique elements of the session, guidelines for flexible delivery, and supplemental resources. Operational definitions of terms used in the manual are presented in Table 8. Procedures of how and why music is presented as informed by the theory-based synthesis of the music are described in the Therapeutic Function of Music Plan presented in Table 9.

Table 8

Operational Definition of Terms

Term	Definition	Examples
Delivery setting	A place or type of surroundings where an intervention takes place	Community-based setting, nursing homes
Delivery format	The way the intervention is delivered	Individual, group
Key components	Essential elements or principles that define each module	Goal setting, mindful music listening
Mechanisms of change	Variables that account for the relationship between an intervention and the outcome	Four emotion regulation strategies suggested in the MBER model
Notes for the clinician	Suggestions regarding what clinicians should do or should not do for optimal therapist effectiveness	Consider family involvement in the session if necessary.
Overarching focus	Focus of a session that gives meaning to the therapist procedures	Psychoeducation, interpersonal emotion regulation through reminiscence
Unique elements of the session	Intervention characteristics that are unique in a given session	Using improvisation as a way to explore and express emotion

The manual also offers broad *fidelity criteria* adapted from Gearing et al. (2011)'s framework of the comprehensive fidelity guide in consideration of the current phase of the MBER-guided intervention development (see Table 7). Characteristics of effective interventions that were illustrated in Table 5 lay the foundation for crucial decision making from the selection of theories to involvement of end-users throughout the manual development procedures.

Table 9

Therapeutic Function of Music Plan

Goal: To decrease depressive symptoms of older persons using the four emotion regulation strategies within the MBER model

Musical Element	Theoretical Framework	Purpose of Musical Element	Explicit Description of the Musical Element
Timbre: Attribute that allows identification between sounds having the same perceptual duration, loudness, and pitch, and often referred to as the color of sound (Patil, Pressnitzer, Shamma, Elhilai,& Theunissen, 2012)	➢ Early musical experience (e.g., piano lesson) is associated with enhancement of later musical engagement and musically satisfied contingency (Flowers & Murphy, 2001). ➢ Piano is an instrument that older adults are the most familiar with (Flowers & Murphy, 2001).	➢ Early music experience often involves music lessons. ➢ Utilization of timber by including instruments that are associated with early music lessons my help bring out past memories; thus it may contribute to engagement and motivation in music experience.	➢ Discuss early attachment to music to increase motivation and participation. ➢ Provide music experiences that utilize piano (e.g., accompaniment, music training). ➢ For those who do not have much musical memory, work on building relationship with music through various formats such as playing instruments and singing. ➢ Provide educational opportunities that have relevance to older adults' early memories with music.
	➢ Community choir provides performance opportunities for music that can be shared with the community, a vehicle for music education, a training ground for those with limited musical background, and an instrument for social change (Sayer, 2010).	➢ Community-based singing provides performance opportunities, education platform for those with and without much musical background, and social integration.	➢ Include community-based choir experience to create performance and educational opportunities, and social integration.
	➢ Playing instruments and singing requires sensory motor	➢ Utilization of timbre through various musical	➢ Use timbre to manipulate level of sensory processing that

	processing of the brain which may have a direct influence on sustained attention (Särkämö, Tervaniemi, & Huotilainen, 2013; Swaine, 2014).	formats including singing and playing instruments may influence sustained attention. ➢ Systematic use of timbre (e.g., layering) may impact sensory motor processing and sustained attention.	impacts sustained attention.
Rhythm: "Durational pattern that synchronizes with a pulse or pulses on the underlying metric level" (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016, p. 2)	➢ "Discernible temporal distribution and organization of events in groupings imposed by a rhythmic structure allow for better perceptual gestalts to emerge, minimizing conflict and difficulty in perception" (Thaut, 2005, p. 5).	➢ Rhythmic patterns allow organization and grouping of musical events that occur simultaneously.	➢ When engaging older adults in music making, establish good sense of rhythm for better organization and groupings of musical events for better perceptual and cognitive processing of music elements for sustained attention and efficient music learning.
	➢ Rhythm, especially in cyclical and periodic form creates anticipation and predictability (Huron, 2006; Thaut, 2005).	➢ Rhythmic patterns that are characterized by periodicity and repetition create predictability.	➢ Use rhythmic patterns that are cyclical and periodic to increase anticipation and predictability for optimal attentional control.
	➢ Syncopated rhythms are perceived as more fun and upbeat than non-syncopated rhythms, especially when a syncopated pattern is followed by a non-syncopated pattern, thus creating more complexity and excitement (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016; Keller & Schubert, 2011).	➢ Syncopated rhythms followed by non-syncopated rhythms create more complexity and excitement.	➢ Use syncopated rhythms followed by non-syncopated rhythms to increase excitement and energy.
	➢ Attunement (i.e., interactive attending)	➢ Rhythmic patterns allow interactive	➢ Facilitate rhythmic patterns that are easily

	involves "synchronous interplay between an attender and an event in which the former comes to partially share the event's rhythmic pattern" (Jones & Boltz, 1989, p. 470).	attending between an attender and a musical event.	shared by the individuals who attend to a musical event in which those rhythmic patterns are embedded.
	➢ Perception of rhythm is highly dependent on metrical prior so that the brain maximizes successful prediction by expecting rhythms to be within a specific matric quality (i.e., duple meter) (Vuust & Witek, 2014).	➢ Perception of rhythmic pattern in relation to metric quality increases brain efficiency in processing music through successful prediction.	➢ Introduce rhythm in relation to metric quality to increase brain efficiency in rhythm perception.
	➢ Movement to music may be partially associated with reduction in depressive symptoms (Choi, Lee, Cheong, & Lee, 2009; Chu et al., 2014; Mohammadi, Shahabi, & Panah, 2011).	➢ Movement to music that utilizes rhythm patterns in an effective way may help decrease depressive symptoms.	➢ Utilize movement to music to improve mood.
	➢ Music training increases memory, visuospatial abilities, socioemotional abilities, and executive functions (Schellenberg & Weiss, 2013).	➢ Musical training that involves building rhythmic foundations may increase many cognitive skills including memory and executive functioning, and socioemotional abilities.	➢ Engage older adults in music training that uses efficient processing of music elements (i.e., building rhythmic foundation).
	➢ Older adults need more trials when processing complex rhythms (Reifinger, 2016).	➢ Strategic music training such as more repetition with emphasis on short phrases may facilitate processing of complex rhythms in older adults.	➢ During music training involving older adults, (a) allow more time to practice learning new skills; (b) provide opportunities to practice motor patterns when engaging them in instrument performance; and (c) focus on short phrases
	➢ Older adults may benefit from practicing motor patterns associated with music learning that involves		

	fine motor skills in short phrases as a single integrated unit (Reiginer, 2016).		as a unit instead of individual notes to increase practice efficiency.
	➢ Motor synchronization to rhythmic patterns in music is associated with evoked experience, especially when music evokes feelings of power and triumph (Vuilleumier & Trost, 2015).	➢ Synchronized movements to rhythm may evoke feelings of power and triumph.	➢ Include motor synchronization to rhythm when intending to increase feelings of power and triumph.
	➢ Engaging in musical behavior requires attention and working memory system that is spread over many prefrontal areas (Särkämö, Tervaniemi, & Huotilainen, 2013). ➢ Perceiving rhythm involves sensory motor processing which may have a direct association with sustained attention (Sarkamo, Tervaniemi, & Huotilainen, 2013; Swaine, 2014).	➢ Music engagement stimulates attention and working memory system. ➢ Rhythm perception involves sensory motor processing and sustained attention.	➢ Manipulate rhythmic complexity (i.e., from simple to complex) to facilitate optimal sensory motor processing. This sensory motor processing may subsequently lead to increased sustained attention within the context of music, therapist-client relationship, and relational reciprocity among clients who share the same rhythmic quality.
Tempo: Speed of a composition's rhythm and is measured according to beats per	➢ Allows individuals to perceive music in an organized manner and forms basis for melodic and harmonic lines (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016).	➢ Tempo allows organization in music perception and functions as foundation for melodic and harmonic progression.	➢ Set clear tempo so that attenders perceive music in the most organized manner and to better establish harmonic and melodic lines.

minute (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016)	➢ Psychophysical attributes of music that drives energy dimension are tempo, intensity, waveform, timbre, and rate change (Thaut, 2005). ➢ Increase in tempo is associated with increased feelings of happiness, surprised, tension, expressiveness, and amusement, and decreased feelings of sadness. (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016) ➢ Fast tempo is associated stronger arousal value (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016).	➢ Tempo allows dynamic energy flow. ➢ Tempo affects emotional valence and arousal level. ➢ Changes in tempo evoke different feelings.	➢ Manipulate tempo to facilitate different emotional valence and arousal (e.g., faster tempo-stronger arousal) ➢ Use increased tempo for expressiveness and decreased tempo for feelings of sadness.
	➢ Once reference level attunement is established through meter and rhythmic pattern, then attentional shifts may occur to musical qualities that require more effortful attending such as shorter time period (Jones & Boltz, 1989).	➢ Faster tempo facilitates more effortful attention.	➢ Establish basic meter and rhythmic pattern then introduce more complex form of tempo (i.e., faster tempo) for optimal attentional shift.
	➢ Older adults experience greater decrease in rhythmic accuracy at faster tempo compared to younger adults (Reifinger, 2016).	➢ Tempo affects rhythmic accuracy.	➢ When practicing songs that are faster and rhythmically asymmetrical, give older adults enough time to practice to build rhythmic accuracy.
	➢ Tempo provides underlying social interaction as individuals (Scollon, 1982 as cited in Fernandez-Sotos,	➢ Tempo provides underlying social mechanism that is shared by individuals who attend the same musical event.	➢ Allow tempo to be consistently and easily shared by older adults who attend the same musical event. ➢ Manipulate tempo to

	Fernandez-Caballero, & Latorre, 2016).		influence dynamics of relational reciprocity among older adults.
Pitch: "Perceptual correlate of periodicity in sounds" (McDermott, & Oxenham, 2008, p. 452)	➢ Upward pitch contour is associated with feelings of fear, surprise, anger, potency, and happiness whereas downward pitch contour is associated with sadness, boredom, and pleasantness (Gabrielsson & Lindstrom, 2010).	➢ Upward and downward pitch contour creates different emotional expression. ➢ Pitch distinguishes highness and lowness of a tone.	➢ Manipulate pitch contour to facilitate different emotional experience (e.g., upward contour-happiness, downward contour-sadness) movement.
	➢ High pitch level creates gaiety, surprise, potency, happiness, fear, and increased tension arousal whereas low pitch level creates seriousness, sadness, solemnity, boredom, pleasantness, and increased valence (Gabrielsson & Lindstrom, 2010).	➢ High and low pitch level creates different emotional expression and arousal. ➢ Upward and downward pitch contour creates different emotional expression.	➢ Match highness and lowness of pitch to desired valence and arousal level (e.g., high-gaiety and tension arousal, low-seriousness and sadness). ➢ Manipulate pitch contour to facilitate different emotional experience (e.g., upward contour-happiness, downward contour-sadness).
	➢ Most comfortable singing range for older adults is between F3 and C5 for women and an octave lower for men (Moore, Staum, & Brotons, 1992). ➢ However, they may also prefer singing songs or listening to music that are outside their comfortable singing range (Yinger & Springer, 2016).	➢ Providing singing range that older adults are comfortable to sing or challenged to sing may increase participation, motivation to learn music, and quality of social interaction.	➢ Use pitch range that is the most comfortable for older adults to sing (i.e., F3-C5 for women and an octave lower for men). Also, challenge them with songs that are outside their comfortable singing range.
	➢ Humans tend to associate increasing musical pitch with	➢ Listening to increasing/decreasing musical pitch creates	➢ Match pitch contour and characteristics of movements (e.g., arms

	ascending objects and decreasing musical pitch with descending objects (Hedger, Nusbaum, Lescop, Wallisch, & Hoeckner, 2013).	mental image of an object ascending/descending.	going up-upward pitch contour) ➢ Use ascending movements for increasing pitch and descending movements of decreasing pitch to teach basic music literacy.
	➢ High pitch level creates gaiety, surprise, potency, happiness, fear, and increased tension arousal whereas low pitch level creates seriousness, sadness, solemnity, boredom, pleasantness, and increased valence (Gabrielsson & Lindstrom, 2010).	➢ High and low pitch level creates different emotional expression and arousal.	➢ Match highness and lowness of pitch to desired valence and arousal level (e.g., high-gaiety and tension arousal, low-seriousness and sadness).
Melody: Sequence of phrased pitch changes (Jones & Boltz, 1989)	➢ Music evokes episodic memory of a listener, which is an important mechanisms of emotional response to music and often involve past and present social relationships (Juslin & Vastfjall, 2008).	➢ Melodic patterns may plan an important role in building association with episodic memory.	➢ Stay close to the original melody when using songs that facilitate reminiscence and social interaction.
	➢ Older adults are slower at reading music while performing fine motor tasks than younger adults and such latency mostly occurs during the premotor period (Reifinger, 2016). ➢ Older adults need more practice time to learn repeated tone sequences on keyboard than younger adults within and across days (Reifinger, 2016).	➢Learning melodies may involve longer practice time for older adults.	➢ Allow enough time to practice fine motor tasks required for reading musical notations and learning a new instrument during music training. ➢ Allow enough practice time to process tone sequences when teaching melodic instruments.

Dynamics: Volume of a composition. It is relative and do not indicate specific volume levels (OnMusic Dictionary, 2015a)	➢ Loudness is a powerful predictor of emotional arousal (Coutinho & Dibben, 2012; Olsen, Dean, Stevens, Bailes, & Cohen, 2015).	➢Dynamics greatly impacts emotional arousal.	➢ Manipulate dynamics to facilitate emotional arousal (e.g., loudness-emotional arousal).
	➢ Decreased efficiency in hearing sound within a context that includes competing sounds may come from age-related changes in auditory system (Reifinger, 2016).	➢Dynamics influences how older adults process competing sounds.	➢ Manipulate loudness of music in a way that maximizes the quality of music listening experience due to decreased ability to hear sounds as part of aging process in older adults.
Lyrics: Words contained in a song	➢ Lyrics play an important role in eliciting reminiscence (Ashida, 2000). ➢ Lyrics affect listeners' perception of emotion (Stratton & Zalanowski, 1994).	➢ Lyrics elicit reminiscence and affect emotional experiences of a listener.	➢ Use lyrics as a basis for music-based reminiscence. ➢ When selecting songs, consider emotional impact of the lyrical content.
	➢ Linguistic analysis of songs that are often used by music therapists working with older adults suggests that those songs tend to have more positive emotion words than negative emotion words (Yinger & Springer, 2016).	➢ Positive emotion words that are included in songs that are often used among music therapists may contribute to positive therapeutic outcomes.	➢ Use songs that have more positive emotion words than negative emotion words.
Form: Structure of a composition and is based upon repetition, contrast, and variation (OnMusic Dictionary, 2015b)	➢ Low complexity is associated with relaxation/less tension, joy, peace, and positive emotions whereas high complexity is related to tension and sadness (Gabrielsson & Lindstrom, 2010).	➢ Level of complexity in musical forms impacts a listener's emotional state.	➢ Use simple musical form to elicit relaxation, joy, peace, and positive emotions ➢ Use complex musical form to elicit tension, which may be followed by tension resolution.

Harmony: Combination of notes sounded simultaneously	➢ Individuals with depression show negatively biased perceived emotions in music (Eerola & Vuoskoski, 2013).	➢ Clinical use of mode may facilitate emotional clarity.	➢ Use dissonant vs. consonant music to help older adults work on emotional clarity as individuals with depression often show biased emotional identification.
	➢ Musical expectation and anticipation is fundamental mechanism of emotional experience of music (Huron, 2006).	➢ Musical anticipation that leads to predictability, plays a critical function in emotional experience in music.	➢ Use predictable mu sic that satisfies anticipation and resolution.
	➢ Simple/consonant harmony creates gaiety, pleasantness, attraction, and tenderness whereas complex/dissonant harmony creates gloom, unpleasantness, tension, fear, and anger (Gabrielsson & Lindstrom, 2010).	➢ Consonant vs. dissonant harmony creates different affect.	➢ Manipulate harmonic properties of music to create various emotional expression .
	➢ Older adults recognize music with a pleasant (consonant) affect better than unpleasant (dissonant) affect (Reifinger, 2016).	➢ Consonant harmony allows older adults to recognize songs better. ➢ Consonant vs. dissonant harmony creates different affect.	➢ Use songs that use consonant harmony to facilitate pleasant affect and personal connection within music.
	➢ Relationship between complexity of music and likability is mediated by predictability thus learning would be most pleasurable with moderate levels of expectation violation based on a person's prior knowledge (Pearce & Wiggins, 2012).	➢ Predictability influences the relationship between song likability and musical complexity. ➢ Expectation violation to the optimal level based on an individual's musical background may increase motivation in learning.	➢ Use coupling of expectation violation and resolution to a moderate level to increase motivation in learning. ➢ Survey and use older adults' prior knowledge about music to guide level of complexity in harmony and expectation violation.

			➢ Avoid using too much simplicity and complexity in music. Use expectation violation and resolution to a moderate level to increase motivation in learning.
	➢ The relationship between desirability and complexity of music shows an inverted U-Shape (Berlyne, 1974).	➢ Too much complexity or simplicity in music loses older adults' song likability.	➢ Avoid using too much simplicity and complexity in music.
Style: Often used interchangeably with the term, genre. The author uses the term, style to denote both categorical types of music (e.g., classical, pop) as well as description of how music is expected to be played or sound (e.g., original style, jazz style)	➢ Characteristics of preferred music among older adults are the following: soothing, relaxing, enlightening, beautiful, comforting, spiritual, and familiar (Flowers & Murphy, 2001).	➢ Genre, familiarity, and overall emotional expression of music influences older adults' song likability.	➢ Provide soothing, relaxing, enlightening, beautiful, comforting, spiritual, and familiar music when older adults select music they would like to listen or sing to.
	➢ Musical expectation is shaped by culture, personal listening history, and musical training (Huron, 2006; Vuust et al., 2005) ➢ Older adults often prefer music that was popular during their early adulthood (Gibbons, 1977; Flowers & Murphy, 2001).	➢ Personal attachment to a musical style influenced by culture, listening history, and training impacts emotional experience. ➢ Popular music that older adults listened to during early adulthood increases likability.	➢ Use musical styles that reflect older adults' musical culture, personal listening history, and training. ➢ Use music older adults listened to during early adulthood to increase deeper emotional experience and social bonding.
	➢ Singing and dancing were two most frequently reported forms of musical activity among older adults (Flowers & Murphy, 2001).	➢ Singing and movement to music that reflect older adults' musical history and taste may increase depth of emotional and reminiscence experience.	➢ Allow singing and moving to music that older adults are stylistically familiar with.

	➢ Lists of songs that are appropriate to use when working with older adults, and categorized by genres and decades can be found in two respective studies: Yinger & Springer (2016) and Cevasco & VanWeelden (2010).	➢ Songs categorized by genres and decades may help intentional selection of songs and reminiscence.	➢ Use lists of songs categorized by genres and decades that are suggested by Yinger & Springer (2016) and Cevasco & VanWeelden (2010) due to the researchers' systematic compilation process
	➢ Home-based music therapy as well as self-administered MT that utilizes music listening of preferred music help decrease depressive symptoms (Hanser & Thompson, 1994).	➢ Listening to music that older adults intentionally select to alter emotional state may decrease negative mood.	➢ Provide home-based music therapy and self-administered music listening that utilizes preferred music to decrease depressive symptoms.
	➢ Recall of a musical piece tends to be close to original in terms of tempo, rhythm, melodic contours, and pitch, and these music characteristics are preserved with remarkable fidelity (Sacks, 2006).	➢ Stylistic characteristics of a song that are defined by tempo, rhythm, and melodic contour in part do not become distorted with aging.	➢ Stay close to the original style of a musical piece.
	➢ Listening to music that is familiar to an individual from past experiences involves processing in hippocampus and medial/temporal/parietal areas, which are associated with episodic memory (Särkämö, Tervaniemi, & Huotilainen, 2013).	➢ Listening to familiar music that reflects past experiences evokes episodic memory.	➢ Facilitate music listening that reflects past experiences.
	➢ Listening to music that an individual has emotional attachment to elicits emotional experience, involves reward system (i.e.,	➢ Listening to music that has personal emotional meaning help regulate autonomic nervous system.	➢ For music listening, use music that a person has emotional attachment with to allow deeper emotional experience,

	dopaminergic network), and has implication in regulating the autonomic nervous system (Särkämö, Tervaniemi, & Huotilainen, 2013).		stimulate reward system, and help regulate emotion and evoke episodic memory.
Meter: Recurring pattern of accents that provide the pulse or beat of music (OnMusic Dictionary, 2015c)	➢ Ability to maintain steady beat remains intact through old age (Reifinger, 2016).	➢ Meter is a basis for steady beat and an ability to maintain a steady beat remains intact through old age.	➢ Use meter as a reference point for tempo and rhythm.
	➢ Meter provides "underlying time frame from which rhythm and tempo deviate on artful temporal journeys" (Jones & Boltz, 1989, p. 467).	➢ Meter functions as a foundation for building rhythm and tempo.	➢ Establish meter concept first and then add rhythmic patterns for better perception and processing of musical sounds.
	➢ Theory of dynamic attending suggests meter may function as a temporal reference frame to which attender initially entrains at a reference level (Jones, 1976).	➢ Meter allows referential attending as opposed to focused attending by providing temporal reference, which in turn leads to entrainment effect.	➢ Establish meter concept first and then add rhythmic patterns for better perception and processing of musical sound.
	➢ Individuals in contact tend to share synchronized movements and common beat patterns (Norris, 2009). ➢ Joint musical activities facilitate release of endorphins and promote social bonding (Särkämö, Tervaniemi, & Huotilainen, 2013).	➢ Engaging in collective music making promotes social bonding.	➢ Have clients share same beat patterns and synchronized movements in a group setting to facilitate socially meaningful experiences. ➢ Create joint music experiences to facilitate joy of music making and social bonding. ➢ Have clients share same beat patterns and synchronized movements in a group setting to facilitate socially meaningful experiences.

Theory-based Synthesis of the Music

For Intentional Selection**:**

Discuss musical styles and songs that influenced older adults' relationship with music to increase motivation and participation. Also, survey musical background (e.g., musical training) to determine complexity of music elements such as rhythm and harmony. Make individualized song lists that older adults can intentionally select and use based on desired emotional goals outside music therapy sessions to allow deeper emotional experience, stimulate reward system, and regulation of emotion with autonomy and independence.

For Attentional Control**:**

Create rhythm-based experiences to increase attentional control through sensory-motor processing of musical sounds which in turn promotes sustained attention. When facilitating the rhythm-based experiences such as collective drumming that utilizes drums and small percussion instruments, (a) establish well-defined meter concept and then add rhythmic and/or melodic patterns for efficient perception and processing of musical sounds; (b) refer to each client's current knowledge about music to establish optimal level of complexity in music elements; (c) engage clients in sharing common movements and beat patterns in joint music making since movements and beat patterns (e.g., meter) have shared qualities; (d) allow motor synchronization to rhythm when intending to increased feelings of power and triumph; (e) set clear tempo so that clients perceive music in the most organized manner; (f) allow rhythmic patterns to be easily shared by the clients who share the same experiences; (g) use syncopated rhythms followed by non-syncopated rhythms to increase excitement and energy; and (h) utilize timber to manipulate energy, musical color, and emotional expression generated by the music experiences.
When meter and rhythm concepts are well established, add melodies that are familiar to the clients' musical culture. This systematic presentation of music elements will add another layer of complexity in sensory motor processing. In order to participate in this more sophisticated music engagement, the clients have to work harder to process sounds that are produced through tactile, motor, singing, and auditory feedback yet benefit from aesthetic quality and joy of music making.

For Cognitive Stimulation:

Older adults are capable of learning music instruments given enough practice time and rest period, and strategies tailored to their needs. When teaching music, (a) consider each client's relationship with music to increase motivation and personal meaning since musical engagement in later life is associated with earlier music experiences (e.g., instrument choice); (b) for those who do not have much attachment to music, work on building relationship with music; (c) be strategic about how to build new skills by focusing on short phrases as a unit vs. individual notes, and working on fine motor tasks with enough repetition; (d) when teaching how to sing, make sure to use pitch ranges that are comfortable for older adults to sing (i.e., F3-C5 for women and an octave lower for men) yet be opened to use singing range outside their comfort zone; (e) avoid songs that are too fast and rhythmically asymmetrical; and (f) stay close to the original melody.

For Social Interaction:

This component of the MBER model is the most musically and cognitively challenging due to (a) increased complexity in musical layer that is temporally changing; (b) active reciprocity in human interaction characterized by symbolic expression of emotional adversities using music; and (c) verbal discussions about music and self/other generated emotionally challenging situations. Clients who participates in this MBER component will be better equipped with means to express themselves with higher level of emotional clarity and presence of others' musical as well as empathetic support. When facilitating emotional expression in a group, (a) have clients share the same beat pattern to increase social bonding; (b) use consonant vs. dissonant to create tension and pleasantness; (c) manipulate tempo to create different emotional valence and arousal level; and (d) utilize timbre to build desired energy. In addition, facilitate music-based reminiscence since it evokes episodic memory which is reported to be associated with reduction in depressive symptoms. When selecting songs for reminiscence, pay attention to lyrics since lyrics play a crucial role in eliciting memories. Also, when delivered live, music should be stylistically close to the original for better emotional attunement to music and to others. Along with the reminiscence, song writing that reflects life experiences, importance values, and confirmation of one's identity may bring new existential meaning to current situations. When creating a new song, use simple form to elicit peace and positive emotions. When complex forms are used, make sure tension is resolved.

CHAPTER IV

RESULTS

Music-based Emotion Regulation (MBER) Intervention Manual for Prevention of Depression in Older Persons was designed to help older persons establish healthy emotion regulation strategies to prevent developing late-life depression. The target population for optimal therapeutic outcomes for this program is older persons who do not meet the diagnostic criteria for clinical depression but show critical symptoms just under the threshold of the diagnosis. Intended settings for the implementation of the program are community-based agents such as county senior centers or community-based music therapy centers through which music therapists can provide group as well as individual music therapy sessions. The program consists of 19 weekly music therapy sessions with flexible delivery schedules based on client needs and funding opportunities. Each session lasts 60 minutes and delivery format (i.e., group, individual) varies according to the goal, practicality, and the purpose of each module. Optimal size of the group is 8-12 clients to ensure opportunities for individual attention while benefitting from group interactions.

The program has four modules and in each module, one of the four MBER strategies is introduced in a sequential manner. Intentional Selection is introduced in module 1 and uses conscious decision making in active participation in the MBER intervention and intentional music listening; Attentional Control is introduced in module 2 and provides music experiences designed to facilitate utilization of optimal attentional resources; Cognitive Stimulation is introduced in module 3 to offer intellectual challenges to older adults who with expanded attentional capacity to meaningful and positive situations in the previous module; and Social Interaction is introduced in module 4 in which individuals engage in music experience characterized by reminiscence, song writing, and verbal/musical interaction in a supportive and empathetic environment. The last module is the most challenging component

of the intervention due to the complexity in musical layers, active manipulation of music elements as a means to express emotions, and frequent reciprocity in client interactions.

In an attempt to "package" the program so that clinicians have access to the manual in its entirety, the author placed the actual MBER manual in Appendix A. Appendix A includes the program overview, description of the theoretical mechanisms of change, literature support, program delivery schedule, session by session contents, and fidelity criteria. The program overview offers a brief description of the program in its entirety and sets the stage for the potential implementation of the manual using the MBER model. Visual representation of the theoretical mechanisms of change shows the potential process of change by describing the supportive theory-base, intervention goals, key components of each module, and intended primary and secondary outcomes of this program. Literature support was directly informed by Chapters 2 and 3 of this dissertation and was intended to help music therapists who are invested in using this manual fully understand conceptual frameworks that lead to the critical elements of the program. The program delivery schedule provides a visual depiction of how the program is structured within a given time frame. Session-by-session content offers session number, overarching focus, session goals, delivery setting, delivery format, duration, procedures, unique elements of the session, guidelines for flexibility, notes for the clinician, and supplemental resources.

CHAPTER V

DISCUSSION

On the basis of the two integrated models, the Preventive Intervention Research Cycle (IOM, 1994) and the Stage Model of Manual Development (Caroll & Nuro, 2002), the author designed a novel program by creating an intervention manual. This intervention manual was guided by a theoretical model, the MBER model (Jang, 2016b), that proposes four music-based emotion regulation strategies that target older persons and the prevention of late-life depression. The Preventive Intervention Research Cycle (IOM, 1994) provided research steps to follow when developing a novel preventive intervention while the Stage Model of Manual Development (Caroll & Nuro, 2022) offered a conceptualization of what needs to be addressed in the manual.

Problem and program theory, that are often considered as the "drivers" of intervention research (Gitlin & Czaja, 2015, p. 69), provided conceptualization of the problem (i.e., depression in older persons), the scope of this intervention development (i.e., prevention), and theoretical mechanisms of change (i.e., MBER model) that may lead to decreased depressive symptoms in older persons. Synthesis of intervention studies that were conducted inside and outside of prevention research in non-music and music approaches guided crucial elements of the session contents such as psychoeducation, active goal setting and problem solving, strategic skill building, meaningful social exchanges, and reminiscence. In addition, critical research outcomes that link emotion regulation and music provide support for the use of music experiences in the categorical level (i.e., music listening, improvisation) as well as in the descriptive level (i.e., systematic layering of music elements for optimal attentional control). Additionally, the TFM plan informed how each music element should be

selected and manipulated based on theoretical frameworks and expert opinions (Hanson-Abromeit, 2015)

The MBER intervention manual is presented in Appendix A in its entirety. The author's intent was to make the intervention manual more user-friendly and to help music therapists who implement this program be best equipped with the theoretical basis and synthesis of current knowledge for optimal therapist effectiveness and dissemination of information necessary for psychoeducation and potential associated funding opportunities. The manual also lays the foundation for further development of the intervention for research purposes. The manual has several components including a program overview, description of theoretical mechanisms of change, literature support, program delivery schedules, session-by-session contents structured around each component of the MBER model, and associated fidelity criteria. Within the session-by-session content, the author delineated overarching focus, goals, delivery setting, delivery format, materials needed, duration, procedures, unique elements of the session, notes for the clinician, flexible approach guidance, and supplement resources.

Strengths and Limitations of the MBER Intervention Manual

Strengths

This MBER intervention manual has several strengths that may have implications for clinical practice and research. First, the music therapy profession is striving to understand the unique impetus for change within the therapeutic relationship impacted by music, therapist, and the client. The therapeutic processes that occur within music therapy involve the unique interplay among the music, therapist, and the client. Music is a complex stimulus (i.e., temporal layering of music elements), therapist effectiveness is often impacted by the therapist's philosophical orientation and clinical wisdom, and human responses to music are

multifaceted (i.e., emotional, cognitive). Therefore, it is difficult to thoroughly examine what makes therapeutic changes and how these three forces contribute to the therapeutic outcomes unless the three forces are clearly defined and articulated. By delineating these three crucial forces (music, therapist, and client) described in an organized manner (i.e., through problem and program theory, TFM, delivery procedures listed in the session by session content), this manual offers an opportunity for a systematic examination of music, emotion regulation, and depressive symptom reduction in older persons, all necessary elements for effective clinical practice.

Second, as researchers invested in intervention-based research gain more understanding about how to make effective interventions, the author followed such researchers' suggestions from theory-guided intervention development to flexible delivery based on client needs and delivery contexts (Gitlin & Cajza, 2015). This manual thoroughly followed those suggestions by designing this MBER program in such a way that (a) it is grounded in theory; (b) it is multicomponent (i.e., strategies), multimodal (i.e., pathways); (c) participant needs and preferences are taken into consideration; (d) participants are actively engaged in problem solving; (e) flexible delivery option is offered; (f) intervention intent is clearly identified in each module; (g) intervention is oriented toward skill building; and (h) participant characteristics reflect program intent (i.e., decreased depressive symptoms). Particularly, manual development based on a program theory (i.e. MBER model) that directly corresponds to the target population (i.e. older persons with subthreshold depression), scope of the program conceptualized by the IOM (i.e. prevention), and intended outcome (i.e. prevention of depression) provides strong theoretical support for the implementation of the MBER program.

Third, this MBER intervention manual provides clear steps to follow which include implementation procedures as well as the theoretical basis that functions as the foundation for essential elements of the program. Therefore, this manual increases potential clinical utility of a novel program and promotes evidence-based practice. Such details in procedures may facilitate collaboration between researchers and clinicians across a continuum of intervention development, refinement, and adaptation as collaborations between researchers and practitioners is "critical in refining program materials and optimizing program effects" (Fraser, Richman, Galinsky, & Day, 2009, p. 151). A disconnect between research and clinical practice is often reported in music therapy and related areas including clinical psychology and social work (Dobson & Hamilton, 2002; Elise, 2015; Fraser, Richman, Galinsky, & Day, 2009; Thompson, 2015) and this manual may open dialogues between researchers and clinicians for the benefit of the target clients and the advancement of the field.

Fourth, many studies examining the effects of music on psychological and physiological functions lack specificity in describing crucial intervention characteristics (e.g., how music is selected) (Jang, 2016a; Robb, Carpenter, & Burns, 2011), which makes it challenging to replicate studies and integrate research into clinical practice. This manual followed all areas recommended in the reporting guidelines for music-based interventions suggested by Robb, Carpenter, and Burns (2011) and supported transparent reporting of procedures pertaining to music and non-music process (See Table 10). Criteria that may help evaluate therapist adherence to the critical intervention characteristics were suggested in the manual yet flexible delivery based on the needs of the clients and the clinical environments is also articulated.

Fifth, intervention designing requires a long-term developmental process of refining and tailoring (Gilgun & Sands, 2012); yet intervention research conducted in music therapy is

frequently designed as small scale research. As a result, interventions that appear to have a great potential to impact public health do not become investigated in large scale studies. This lack of systematic and purposeful investigation becomes a threat to external validity and can be a roadblock to funding opportunities. The author developed this MBER-guided intervention manual through the systematic process of generating theories, reviewing characteristics of evidence-based programs that have shown promising results, and creating a program manual as the foundation for the initial exploration as well as future elaboration of the MBER-line research.

Table 10

Music-based Intervention Reporting Criteria
Source: Robb, Carpenter, and Burns (2011)

Intervention theory
Intervention content
Person selecting the music
Music (e.g., reference, overall structure)
Music delivery method (i.e. live or recorded)
Intervention materials (i.e. music and non-music materials)
Intervention strategies (e.g., music listening, song writing)
Intervention delivery schedule
Interventionist (i.e., qualifications, number of interventionists)
Treatment fidelity
Setting
Unit of delivery (i.e., individual, group)

Limitations

At this time, limitations of this MBER intervention manual include lack of practice guidelines for settings other than community-based settings and the fact that the MBER model is a novel theoretical model. Due to the current phase of the MBER-guided intervention research and the current stage of manual development, further iteration of the manual needs to occur before suggesting guidelines for the use of this program in other

settings, such as nursing homes, and within different cultural contexts. The author followed the guidelines of the Stage 1 of the Stage Model of Manual Development that was strategically placed in the author-developed research phase centered around the MBER model. Due to the fact that adaptation and tailoring processes of this program based on various therapeutic settings and cultural contexts are set to occur in the next phase of the intervention research using the MBER model, this manual does not provide procedures relevant to practice settings that are different from the intended population and therapeutic contexts. As the program goes through rigorous testing through pilot testing and efficacy trails as illustrated in Figure 5, more sophisticated procedures and processes relevant to various practice settings should be considered.

Another limitation of this intervention manual is that it is developed based on a program theory (i.e. MBER model) that was created as partial fulfillment of the author's doctoral program and has not yet been reviewed outside the program (i.e., expert blind review). Although the author developed the theory both as suggested by predecessors of intervention research in a systematic manner using a qualitative methodology and following a systematic review in preparation for this project, it should be noted that this MBER intervention manual was created based on a novel theoretical model and is not the only way that the program can be structured, articulated or centered around the MBER model (Jang, 2016b).

Challenges in Developing an Intervention Manual

The author found it challenging to develop a novel intervention due to lack of published knowledge frameworks associated with intervention development in the field of music therapy. Knowledge base that informs intervention development that is specific to music which may include the process of designing music-based interventions and related

considerations that should be given regarding dose, frequency, and delivery methods are not well examined and articulated in music-based intervention research. In addition, the IOM clearly identifies three intervention phases (i.e. prevention, treatment, and maintenance) yet research that centers on prevention is scarce in music research and focused attention was given to depression treatment rather than prevention in older adults (Jang, 2016a). More theories and intervention-based research studies are needed to guide intervention development and clinical practice to improve emotional health of older adults who are at increased risk of developing mental health issues before those issues become clinically significant and lead to impaired functioning.

In addition, in the process of reviewing literature that has relevance to the contents of this intervention manual, the author had to modify some of the music experiences that were originally identified in the MBER model (Jang, 2016b). For example, music-based reminiscence was initially placed under Cognitive Simulation, one of the four emotion regulation strategies suggested in the MBER model. However, after examining literature that focused on reminiscence, the author concluded that reminiscence experience may be more closely related to interpersonal emotion regulation through musical and verbal exchange in the context of prevention of depression in older persons rather than a way to stimulate intellectual capacity as in individuals with dementia. Therefore, the music-based reminiscence was implemented under Social Interaction, the fourth emotion regulation strategy articulated in the MBER model.

Implication for Future Research and Clinical Practice

From a research perspective, stakeholders and funding agents often require logic models, credible evidence, and evaluation data when introducing and evaluating programs: thus, this manual may serve as a valuable resource for future funding opportunities. In

addition, this manual may facilitate further research opportunities and collaborations as the manual goes through research phases from pilot testing to tailoring of interventions in consideration of dynamic therapeutic contexts. Transparent and detailed reporting as well as fidelity criteria will make it possible to implement and replicate studies that will help ensure that crucial elements of the program are delivered as intended.

From a clinical perspective, this manual provides clear guidelines as to what procedures to follow and how to implement this program from selection of screening tools that may suit the needs of the clinicians to supplemental resources from which therapists can find additional information related to the focus of each session. Poor intervention reporting and lack of details in music-based intervention research makes it difficult not only to replicate studies in research but also to make clinical translation of the research outcomes to professional practice (Jang, 2016a; Robb, Carpenter, & Burns, 2011). This MBER intervention manual clearly delineates the process, articulates literature support that provides theoretical basis, and defines clinical tools to be used (i.e., intentional music listening); thus, this manual has a great potential to be used in clinical settings and create dialogue among researchers and clinicians, which may contribute to bridging the gap between research and clinical practice.

Closing Thoughts and Recommendations

The application of this manual in clinical practice and its functional implementation in the future research agenda of the author were clearly delineated in Chapter 3. In closing, it is recommended that music therapists who find this manual helpful and are invested in the implementation of this program in their clinical practice settings should be guided by the literature support included in the manual and follow the step-by-step procedures outlined in the session-by-session contents. If modifications need to occur due to dynamic needs of the

clients and practice settings, and/or issues related to feasibility of the program, the author encourages music therapists to consult with this author and provide feedback for further development of the intervention and constructive revision of this intervention manual. This collaborative spirit and collegial interaction will strengthen this manual and broaden its scope to different clinical settings beyond community based settings with diverse population factors integrated.

The author identifies involving expert reviews, and feedback from community dwelling older adults and/or stakeholders as the next step of this intervention and intervention manual development (Fraser, Richman, Galinsky, & Day, 2009; Gitlin & Czaja, 2015). Experts may involve clinicians and scholars who have extensive experience working with older adults. Insights gained from these expert reviewers and feedback from the target population may minimize barriers to implementing a novel program and maximize readiness of this intervention manual for implementation, and provide valuable input for subsequent testing of this program. The author welcomes feedback from such stakeholders, as future iterations of this intervention manual are essential to continued refinement as it is used in clinical practice and intervention research.

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Appendix A

Music-based Emotion Regulation Intervention Manual

Table of Contents

List of Tables

List of Figures

Program Overview

Music-based Emotion Regulation (MBER) Intervention Manual for Prevention of Depression in Older Persons is designed to help older persons establish healthy emotion regulation strategies to prevent developing late-life depression. This program is based on theories that (a) late-life depression is a consequence of various biological, psychological, and social factors that increase the likelihood of experiencing depressive symptoms; and (b) music can provide active and adaptive emotion regulation strategies that involve setting up emotionally meaningful goals and striving to achieve those goals (Intentional Selection), practicing attentional control (Attentional Control), participating in cognitively challenging exercises (Cognitive Stimulation), and engaging in meaningful social interactions in the community (Social Interaction).

The target population for optimal therapeutic outcomes for this program is older persons who do not meet the diagnostic criteria for clinical depression but show critical symptoms just under the threshold of the diagnosis. Intended settings for the implementation of this program are community-based agents such as county senior centers or community-based music therapy centers through which music therapists can provide group as well as individual music therapy sessions. The program consists of 19 weekly music therapy sessions with flexible delivery schedules based on client needs and funding opportunities. Each session lasts 60 minutes and the delivery format (i.e., group, individual) varies according to the goal, practicality, and purpose of each module. Optimal size of the group is 8-12 clients to ensure opportunities for self-expression while benefitting from group interactions.

The program is built and structured on the basis of the Music-based Emotion Regulation (MBER) model (Jang, 2016b), a theoretical model that suggests four emotion regulation strategies using various types of music experiences. The program has four modules

and in each module, one of the four strategies is introduced in a sequential manner. The first module, Intentional Selection, focuses on active involvement in selecting emotionally meaningful situations, and setting up realistic goals and achieving those goals through community-based music engagement. Clients who participate in this first module (a) receive psychoeducation about depression and prevention, and gain an understanding about the intent and contents of the overall program; (b) explore and acknowledge their own current emotional state; (c) set emotional goals based on this information; and (d) make conscious decisions about active participation in community-based music engagement opportunities as well as intentional music listening outside music therapy sessions. For individuals who do not have the cognitive capacity to expose themselves to emotionally and socially challenging situations, a music therapist may visit their home and provide individualized home-based music therapy for additional emotional support so that they are empowered to make conscious decisions about participating in this community-based music program.

The second module, Attentional Control, addresses how an individual directs attentional focus within a given situation by potentially distracting internal focus from a negative situation (i.e., distraction) and/or focusing on specific positive features of an emotional situation (i.e., concentration). By using these distraction and concentration strategies, the clients learn to develop attentional capacity through sensory processing of musical sounds and musical communication with the music therapists and peers. Clients who participate in this second module learn to practice increasing sustained attention through sensory processing of a systematic and cumulative exposure to music elements starting with meter and rhythm, moving to more complex rhythms, and subsequently melody and harmony.

The third module, Cognitive Stimulation, targets increasing or maintaining cognitive functioning through intellectual stimulation on the premise that cognitive ability is closely related to emotion regulation and also an important marker for healthy aging. Clients who

participate in this third module are intellectually challenged through music learning based on their current knowledge in music, self-identified learning goals, and chosen instruments. Clients are offered individual music lessons and they have an opportunity to perform a song that they put effort into mastering at a concert scheduled outside the music therapy sessions upon the conclusion of this module.

The fourth module, Social Interaction, is about developing interpersonal emotion regulation skills in the presence of others. Clients who participate in this module engage in reciprocal musical and verbal interactions characterized by music-based reminiscence and shared symbolic expressions of and discussions about current emotional difficulties designed to promote empathy, sense of belonging, and acceptance of self. Additionally, clients collaborate on writing a song that connects the past, present, and future through reappraisal of the current emotional challenges in the context of the past and the future.

The following sections of this manual include theoretical mechanisms of change, literature support, program delivery schedules, session-by-session content descriptions, and fidelity criteria information. Visual representation of the theoretical mechanisms of change is provided to show process of change by describing theory-base, intervention goals, key components of each module, and intended primary and secondary outcomes of this program. Literature support provides conceptual frameworks that guided MBER program development to promote evidence-based practice, inform psychoeducational components of the program, and to increase therapist effectiveness.

The program delivery schedule is offered so that music therapists who use this manual can easily gain insights into how the intervention is structured within a given time frame. Session-by-session content includes session number, overarching focus, session goals, delivery setting, delivery format, duration, procedures, unique elements of the session,

guidelines for flexibility, notes for the clinician, and supplemental resources. Operational definitions of terms used in the manual are as follows (Table 1):

Table 1

Operational Definition of Terms

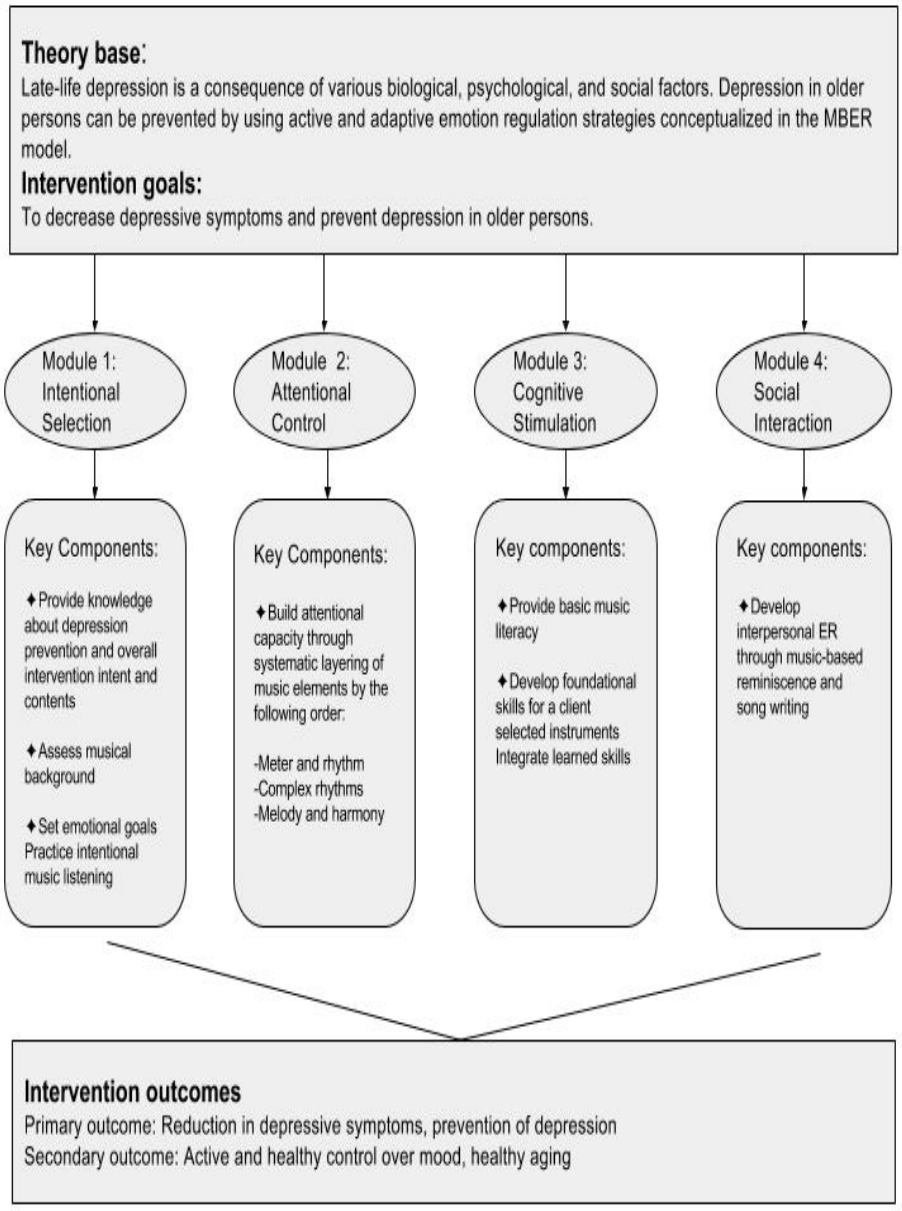
Term	Definition	Examples
Delivery setting	A place or type of surroundings where an intervention takes place	Community-based setting, nursing homes
Delivery format	The way the intervention is delivered	Individual, group
Mechanisms of change	Variables that account for the relationship between an intervention and the outcome	Four emotion regulation strategies suggested in the MBER model
Notes for the clinician	Suggestions regarding what clinicians should do or should not do for optimal therapist effectiveness	"Consider family involvement in the session if necessary."
Overarching focus	Focus of a session that gives meaning to the therapist procedures	Psychoeducation, interpersonal emotion regulation through reminiscence
Unique elements of the session	Intervention characteristics that are unique in a given session	Using improvisation as a way to explore and express emotion

The author connects session-by-session contents and the literature support section of this manual by directing readers to the relevant knowledge framework when defining crucial elements of the program. By following the page numbers that are listed by the crucial elements introduced throughout the manual, readers can benefit from using the conceptually integrated synthesis of current knowledge in psychoeducation, theory-guided intervention delivery, dissemination of information, and conversations with stakeholders in funding opportunities when necessary.

This program is designed to be facilitated by credentialed music therapists who have experience working with older adults and an understanding about their unique learning needs, emotional challenges, and social and communication patterns. More importantly, it is imperative that the therapists understand how music influences psychological and physiological functioning and has the ability to manipulate music elements using various

music experiences such as song writing and instrument improvisation. Music therapists who plan to use this program are strongly encouraged to gain an in-depth understanding about the intervention theory, theoretical basis for the music selection and facilitation, and current practices in and outside music therapy in the context of late-life depression, prevention, and emotion regulation. This examination will increase readiness and confidence before implementing this program; thus, enhancing therapist effectiveness for the most optimal therapeutic outcomes.

Theoretical Mechanisms of Change



Literature Support

The design of an intervention involves two integrated conceptualizations: problem theory and program theory. Problem theory "spells out putative risk and protective factors related to a specific problem" whereas program theory articulates logic of the intervention and functions as "the basis for the development of intervention manuals and protocols" (Fraser, Richman, Galinsky, & Day, 2009, p 62). Therefore, this author identifies the problem theory by articulating the epidemiological findings and reviewing risk and protective factors associated with late-life depression in a preventive framework. The author delineates the program theory by introducing the MBER model that suggests emotion regulation strategies that target decreased depressive symptoms in older persons. In the last section of this chapter, existing interventions as part of depression treatment and prevention are reviewed along with screening tools for which reliability and validity as well as sensitivity and specificity have been tested.

Conception of the Problem

Depression in older persons. Depression is one of the most common mental health disorders and is caused by a combination of genetic, biological, environmental, and psychological factors (National Institute of Mental Health [NIMH], 2016). Depression can be detrimental to the elderly population as it (a) complicates chronic diseases such as stroke and heart disease, (b) leads to higher functional impairment and disability; (c) increases mortality due to suicide or cardiac disease; (d) contributes to significant economic costs; and (e) threatens quality of life of older persons and their family members (Center for Disease Control and Prevention [CDC], 2012; Cuijpers et al., 2015; Sathyanath, Kundapur, Bhat, & Kiran, 2014).

Depression is not a normal part of aging and is often mistreated or undiagnosed due to symptoms being overlooked in the presence of other medical conditions, lack of knowledge about appropriate treatments, and individuals' lowered inclination to acknowledge feelings of sadness or grief (CDC, 2012). There are three types of depression: major depression, minor depression, and dysthymia (American Psychiatric Association, 2013). Symptoms and diagnostic criteria of these three types of clinical depression are described in Table 1. Epidemiological studies suggest prevalence of older adults developing major depression is relatively small and only accounts for 1-4% of the elderly population but the number increases dramatically to 4-13% when including minor depression (Alexopoulos, 2005).

Prevention of depression. The Institute of Medicine (IOM, 1994) divides intervention phases into prevention, treatment, and maintenance within the Continuum of Care model (see Figure 1). Prevention occurs prior to the onset of a mental health disorder. Treatment is implemented after the onset of the target disorder. Maintenance is an effort to reduce relapse or recurrence of the disorder after an individual experiences acute symptoms (Munoz, Beardslee, & Leykin, 2012). The Continuum of Care model has become a standardized way of conceptualizing prevention among policy makers, practitioners, and researchers in behavioral health science (Springer & Philips, 2006). Within the prevention phase, the IOM suggests three types of preventive interventions: universal, selective, and indicated (see Figure 1).

Table 2

Symptoms and Diagnostic Criteria of Clinical Depression
Source: American Psychiatric Association (2013)

Major Depression	Minor Depression
F. Depressed mood or loss of interest/pleasure over a two-week period accompanied by at least four of the following symptoms:	B. Depressed mood or loss of interest/pleasure over a two-week period accompanied by at least one of the following symptoms
10. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) of observation made by others (e.g., appears tearful) 11. Markedly diminished interest or pleasure in al, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation) 12. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. 13. Insomnia or hypersomnia nearly every day 14. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down) 15. Fatigue or loss of energy nearly every day 16. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day 17. Diminished ability to think or concentrate, or indecisiveness, nearly every day 18. Recurrent thoughts of death (no just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide	
G. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning	
H. The episode is not attributable to the physiological effects of a substance or to another medical condition	
I. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.	
J. There has never been a manic episode or a hypomanic episode.	
Dysthymia (Persistent Depressive Disorder)	
G. Depressed mood for most of the day, for more days than not, for at least two years	
H. Presence, while depressed, of at least two of the following: 7. Poor appetite or overeating. 8. Insomnia or hypersomnia. 9. Low energy or fatigue 10. Low self-esteem. 11. Poor concentration or difficulty making decisions. 12. Feelings of hopelessness	
I. During the two-year period of the disturbance, the individual has never been without the symptoms in Criteria A and B for more than two months at a time.	
J. Criteria for a major depressive disorder may be continuously present for two years.	
K. There has never been a manic episode or a hypomanic episode, and criteria have never been met for cyclothymic disorder.	
L. The disturbance is not better explained by psychotic disorders such as schizophrenia.	

Universal interventions target the whole population whether the risks are large or small (Cuijpers, Beekman, & Reyholds, 2012). A community program that targets the entire elderly population to deter the onset of depression is an example of a universal intervention. Selective interventions focus on subgroups of a population whose risk of developing a disorder is above average and these subgroups may be identified by social demographics such as age, gender, or level of education (IOM, 1994). An intervention that targets a group of elderly women who recently experienced loss of a loved one may be an example of a selected intervention. Indicated interventions target individuals who do not fully meet diagnostic criteria but show symptoms just under the threshold for a specific diagnosis, thus who are at high risk for future development of the diagnosis (Cuijpers, Beekman, & Reyholds, 2012; Eyre, Baune, & Lavretsky, 2015). An intervention that is directed toward older adults in residential care facilities who are reported to show considerable depressive symptoms by staff and/or family members may be an example of an indicated intervention.

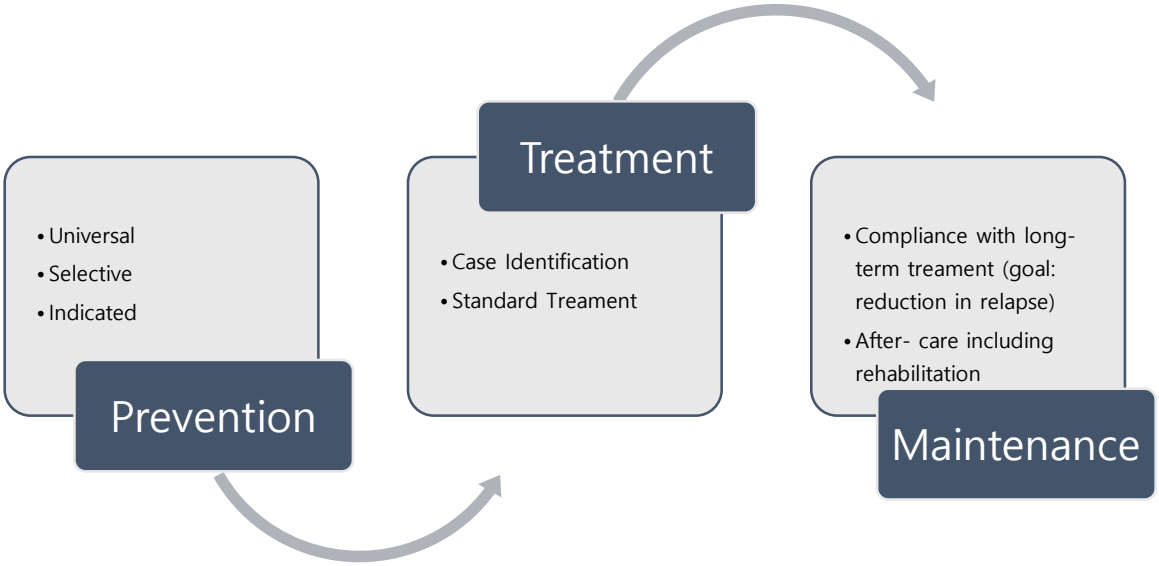


Figure 1. Institute of Medicine (IOM) Continuum of Care model
Source: Adapted from the Institute of Medicine (1994)

Major functions of all three types of preventive interventions – universal, selective, and indicated – are (a) to decrease the occurrence of new cases, (b) to delay the onset of a

disease in addition to the absolute prevention of new cases, and (c) to reduce the length of time the early symptoms continue and subsequently prevent progression of severity so that individuals do not meet the diagnostic criteria (IOM, 1994). Health care professionals are consistent in their view to put stronger emphasis on prevention because these efforts could prevent 24.6% of new onsets in a three-year period and reduce a substantial amount of the disease burden (Schoevers et al., 2006).

Half of older persons with depression have their first onset in late-life; therefore, preventive interventions that target older adults who are subsyndromal (i.e. individuals who show symptoms just under the threshold for depression) at an earlier age may be the most promising approach in order to prevent development of the full-blown disorder (Fiske, Wetherell, & Gatz, 2009; Forsman, Schierenbeck, & Wahlbeck, 2011). However, interventions that target reducing the incidence of late-life depression are sparse; thus, this ever growing aging population calls for innovative and cost-effective preventive interventions that have a high impact on emotional health and subsequently promote healthy aging.

Review of Risk and Protective Factors

The process of critically identifying and examining risk and protective factors associated with a mental health disease is a crucial step to take when designing a preventive intervention as these interventions are often directed toward reducing risk factors and increasing protective factors (IOM, 1994). Within the Preventive Intervention Research Cycle that was conceptualized by the IOM, the initial step is to build a knowledge base through problem identification that is foundational to intervention development and refinement as identified in Figure 2. Reviewing risk and protective factors is the research step that follows identifying a problem and examining its extent. In this section of the chapter, the author provides a definition of risk and protective factors, reviews risk factors using three

categorical descriptors (i.e. biological, psychological, and social), and then articulates protective factors associated with depression in older persons.

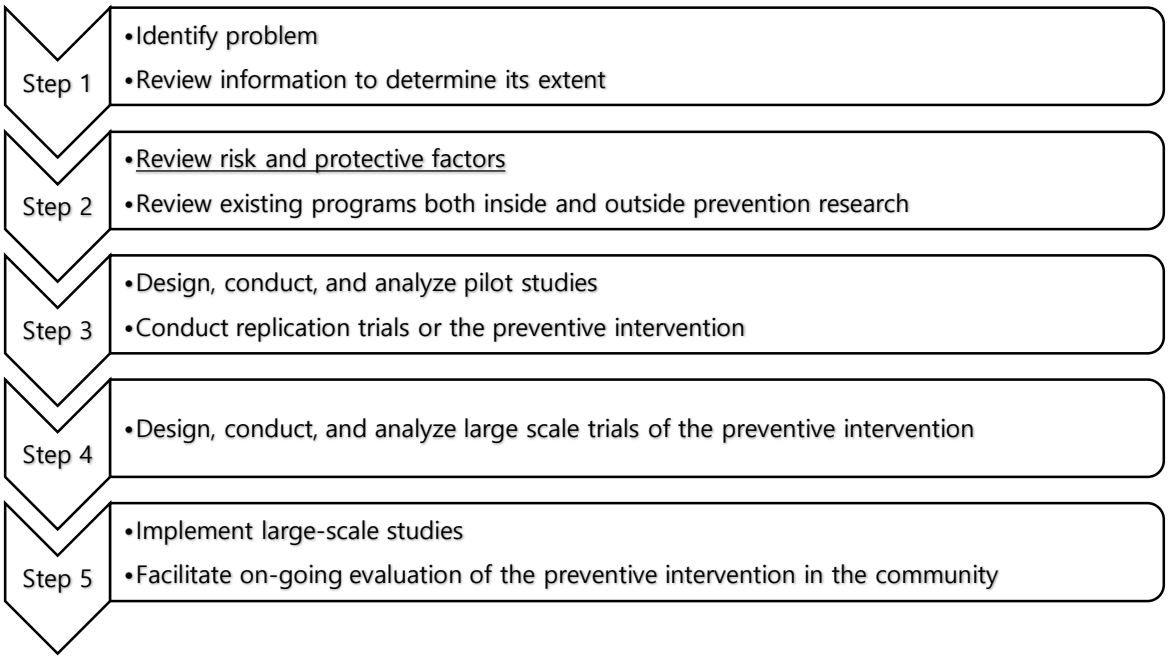


Figure 2. Preventive Intervention Research Cycle
Source: Institute of Medicine (1994)

Definition of risk and protective factors. Risk factors are those factors that increase the likelihood of developing a disorder if present for a given individual rather than someone selected at random from the general population (IOM, 1994). Risk factors associated with a disorder may reside within the individual, family, or community and can be biological, psychological, or social in nature (Alexopoulos, 2005; IOM, 1994; Vink, Aarten, & Schoevers, 2008). Some risk factors play a causal role and others merely increase vulnerability to a specific disease.

Protective factors are those factors that "enhance the likelihood of positive outcomes and lessen the likelihood of negative consequences from exposure to risk" (World Health Organization, 2004, p. 1), are expressed at the individual, family, or community level, and can be biological or psychological, or social in nature (IOM, 1994). It is important to note that both risk and protective factors do not function in isolation; rather "there exists a

dynamic interaction among them that undergoes modification and change throughout an individual's life span" (IOM, 1994, p. 186).

Biological risk factors. Although the exact weight of genetic and non-genetic factors remains to be examined, there is strong support that risk for mood disorders becomes larger when genetic transmission occurs (IOM, 1994; Oldehinkel, Ormel, Brilman, & van den Berg, 2003). Genetic markers for late-life depression have not been clearly identified but a twin study suggests that hereditary factors account for 18% of the variations in depressive symptoms (Alxopoulos, 2005; Gatz, Pederson, Plomin, & Nesselroade, 1992). However, less severe forms of depression such as minor depression show less heritability (Tsuang & Faraone, 1990).

Eighty percent of older adults have at least one chronic health condition while 50% have two or more. This increases the likelihood of older adults developing depression because depression is more common in people who have other chronic health conditions (CDC, 2012). Braam et al. (2005) found a linear association between depressive symptoms experienced in later life and chronic diseases and functional disability. It is reported that about 25% of individuals with myocardial infarction have major depression and another 25%, minor depression (Alexopoulos, 2005). Use of psychotropic medication also increases the risk of depression. Lists of medical conditions and drugs associated with late-life depression are summarized by Alexopolous (2005) and provided in Table 3.

Table 3

Medical Conditions and Drugs Associated With Late-life Depression
Source: Alexopoulos (2005)

Medical Conditions Associated with Depression	**Drugs Associated with Depression**
Viral infection	Methyldopa
Endocrinopathy e.g.,hypothyroidism, hyperthyroidism, hypoparathyroidism, hyperparathyroidism, hypoadrenocorticism, hyperadrenocorticism, Cushing's disease	Benzodiazepines Propranolol Reserpine Steroids Anti-Parkinsonian drugs
Malignant disease e.g., leukemia, lymphoma, pancreatic cancer	ß blockers Cimetidine Clonidine
Cerebrovascular disease e.g., lacunar infarcts, stroke, vascular dementia	Hydralazine Oestrogens Progesterone
Myocardial infarction	Tamoxifen Vinblastine
Metabolic disorder e.g., B12 deficiency, malnutrition	Vincristine Dextropropoxyphene

Neuroimaging and neuropsychological studies in clinical aging literature have identified vascular factors that increase the risk of depression in later life: cerebrovascular incidents, cardiovascular factors, white matter hyperintensities, atherosclerosis, high blood pressure, and foetal undernutrition (i.e. fetal malnutrition) (Hickie et al., 2003; Vink, Aartsen, & Schoever, 2008). Some researchers used a term, vascular depression, to describe the relationship between cerebrovascular disease and disruption of fronto-subcortical circuits that regulate mood, cognition and movement, especially for those who experience depression for the first time after 50 years of age (Alexopoulos et al., 1997; Hickie et al., 2003; Krishnan, Hays, & Blazer, 1997; Krishnan & McDonald, 1995).

Jorm et al. (2005) found significant association between white matter hyperintensities and depression in older adults in an MRI study that involved 475 community samples of individuals aged 60 to 64 and provided support for the existence of vascular depression. Tiemeir et al. (2004) investigated the relationship between atherosclerosis, the most common underlying cause of heart attack and late-life depression and found that for every one standard deviation increase in more severe extra-coronary atherosclerosis, the prevalence of developing depression increased by 30% in a large prospective, population-based cohort (i.e., Rotterdam) study.

Hybels, Blazer, and Pieper (2001) identified risk factor profiles of 162 community-dwelling older adults divided into two groups, one with more severe depression and one with sub-threshold depression, and found that depression in both groups was associated with impairment in physical functioning, disability days (i.e., one in which a person spent all or partial day in bed or was kept from usual activities due to illness), and poor self-perceived health. In addition to the actual and perceived health conditions, changes in physical health, new medical illness, sleep disturbance, low level of exercise and physical activities also increase the likelihood of developing depression in older persons (Jang, Haley, Small, & Mortimer, 2002; Livingston, Blizard, & Mann, 1993; Lyness, Duberstein, King, Cox, & Caine, 1998; Vink, Aartsen, & Schoevers, 2008).

Although it is difficult to determine whether a condition or behavior causes depression or depression is the cause of a condition or behavior, there are some conditions and behaviors known to have an association with depression in older adults such as smoking, alcohol consumption, and obesity (CDC, 2016; Vink, Aartsen, & Schoevers, 2008). Although its hallmark is cognitive decline, Alzheimer's disease is also reported to show an association with depression as 25% of individuals with Alzheimer's disease experience depression that is

characterized by less control over their feelings and how they express them (Alexopoulos, 2005; Lyketsos & Olin, 2002).

Psychological risk factors. Research has shown correlations among psychological risk factors which include coping strategies, locus of control, personality traits, and depressive symptoms in the elderly population. Coping refers to "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transaction" (Folkman, 1984, p. 843). Coping has two major functions: regulation of emotion or distress (i.e., emotion-focused coping) and management of problems that cause distress (i.e., problem-focused coping) (Folkman & Lazarus, 1980). Problem-focused coping is accompanied by emotion-focused coping in most stressful encounters because it is required to have at least some control over one's emotions when trying to manage stressful situations (Folkman, 1984). Dysfunctional emotion-focused coping such as ruminating and catastrophizing can be detrimental and is significantly related to depression (Kraaij, Pruymboom, & Garnefski, 2002; Thompson et al., 2010). Maladaptive coping strategies, such as avoidance, especially among elderly cancer patients, may also increase risk of individuals developing depression (Aarts et al., 2015).

Locus of control is a concept that describes the extent to which an individual expects that an outcome of his/her behavior is contingent on his/her own behavior or personal characteristics (Rotter, 1990). People with high internal locus of control believe that they have control over the events that influence their lives. In contrast, people with high external locus of control believe that they have little control over what happens around them and the amount of effort they put into a situation has little impact on the consequences of their actions. Studies show use of more external locus of control and less problem-focused coping strategies are associated with depression in older adults, and the correlation is stronger with

those who were hospitalized compared to community-dwelling older adults (Beekman et al., 2004; Bjorklof et al., 2016).

Inherent personality traits are also associated with depression. The Five-Factor Model suggests that personality can be described in five broad dimensions: Openness to Experience or Intellect, Conscientiousness or Will to Achieve, Extraversion or Surgency, Agreeableness as the opposite of Antagonism, and Neuroticism or Emotional Liability (McCrae & Costa, 2008). Among these five personality traits, Neuroticism is directly related to emotion regulation because individuals who score high on Neuroticism tend to be more prone to mood swings and emotional reactivity, more vulnerable to high stress, and more likely to experience depression and anxiety (Koorevaar et al., 2013; Peerenboom, Collard, Naarding, & Comijis, 2015). In addition, individuals who score low on Extraversion (i.e., positive motion and activeness) are more likely to show depressive symptoms than those with high Extraversion score (Peerenboom, Collard, Naarding, & Comijis, 2015).

Social risk factors. Researchers have identified lack of social support, experiences of negative life events, and some demographic features as social risk factors. Social support is one of the social determinants in the general population and there are two types of social support as identified in Cobb (1976): structural and functional support. Structural support is about amount, density, and frequency of contact while functional support is the quality of the support given by one's social network. Older persons who experience a lack of social support on both structural and functional levels and as such suffer from social isolation are at a high risk of developing depression (Alexopoulos, 2005; Beekman et al., 2004; Grav, Hellzen, Romild, Stordal, 2011; Vink, Aartsen, & Schoevers, 2008). Emotional loneliness, often characterized by lack of social interaction, also increases depression (Peerenboom, Collard, Naarding, & Comijs, 2015).

In addition, Kraaij and de Wile (2001) found that a depressive mood at an older age was related to negative life events, emotional abuse and neglect experienced during childhood, sexual abuse and neglect, and relational stress with significant others experienced during (late) adulthood. Also, the sum of all negative life events across the life span has a positive relationship with depressive symptoms in later life; however, when experiencing more recent adverse life events, older adults are more prone to suffer from depression (Beekman et al., 2004)

Studies show that some demographic factors have a correlation with age-related depression. The following conditions are reported to increase the likelihood of an older person developing depression: marital status (i.e. unmarried, divorced, or widowed), gender (i.e. female), living condition (i.e. living alone, living institutionalized), fulfilling a care giver role, lower level of education, lower socioeconomic status, and more severe medical conditions (Alexopoulos, 2005; Beekman et al., 2004; Hybels, Blazer, & Pieper, 2001; Lee, Hasche, Choi, Proctor, & Morrow-Howell, 2013).

Protective factors. Existence of social support, individuals' positive perception about their support system, and engagement in spiritual practice serve as protective factors. Social support is defined as information leading the subject to believe that (s)he is cared for and loved, and is an esteemed and valued member of a network of communication and mutual obligations (Cobb, 1976). Social support in aged persons makes an important protective contribution against depression and functions as emotional, informational, and instrumental (e.g., providing rides) support (CDC, 2008). Gender differences seem to exist when receiving support as women seem to prefer more emotional support that involves caring, empathy, love, and trust while men prefer more instrumental support such as provision of tangible goods and services (Grav, Hellzen, Romild, & Stordal, 2011). Along with the nature and quality of the

social network, one's positive perception about the support system also plays a protective role against depression (Cummings, 2003).

Engagement in spiritual practice also correlates with better physical and mental health that includes decreased depressive symptoms and increased self-efficacy and health conditions (Cummings, 2003). Braam et al. (1997) examined the association between religious involvement and depression in 2,817 Dutch citizens aged 55-85 years and found that religious involvement assessed through frequency of church attendance and strength of church affiliation, had a negative relationship with depression, both on symptom and syndrome levels. In addition to participation in religious activities, private spiritual practice such as Bible reading and prayer was also associated with lower levels of depression among community-dwelling older adults and individuals in nursing homes (Cummings, 2003). Also, individuals who report high levels of spirituality often characterized by finding meaning and purpose in life show less depressive symptoms (Bamonti, Lombardi, Duberstein, King, &Van Orden, 2016).

MBER as a Program Theory

Theories in intervention research play a crucial role in all phases of research (i.e., development, evaluation, and implementation). Program theory (a) guides selection of important components of intervention delivery; (b) informs evaluation process (i.e., fidelity check); (c) provides information on how and why an intervention works; (d) aids identification of aspects of an intervention that need to be modified or adapted based on contextual factors, such as practice settings and cultural variations; and (e) provides basis for underlying mechanisms of change (Gitlin & Czaja, 2015). Theory-based intervention research, particularly in music therapy helps "advance our understanding of the complex interactions between music, clients, and the education or healthcare environment" (Robb, 2012, p. 5).

The Music-based Emotion Regulation (MBER) model was originally developed to inform intervention research and clinical practice through a conceptualization of music guided emotion regulation strategies that target older persons and depression prevention (Jang, 2016b). Emotion regulation refers to "extrinsic or intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features to accomplish one's goals" (Thompson, 1994, p. 27-28). Emotion regulation is context dependent but there are three factors that are common for adaptive emotion regulation: awareness, goals, and strategies (Thompson, 1994).

In the MBER model, Jang (2016b) proposes four active emotion regulation strategies that may help prevent older adults from developing depression: Intentional Selection, Attentional Control, Cognitive Stimulation, and Social Interaction. This theoretical model is guided by neuroscience research in music, music psychology, music therapy and music education research, human development and aging literature, and emotion regulation studies. It provides a theoretical support for the regulatory use of music on an individual, social, and community level. Definition of these four strategies and music experiences that music therapists may use under each strategic component of the model are illustrated in Figure 3.

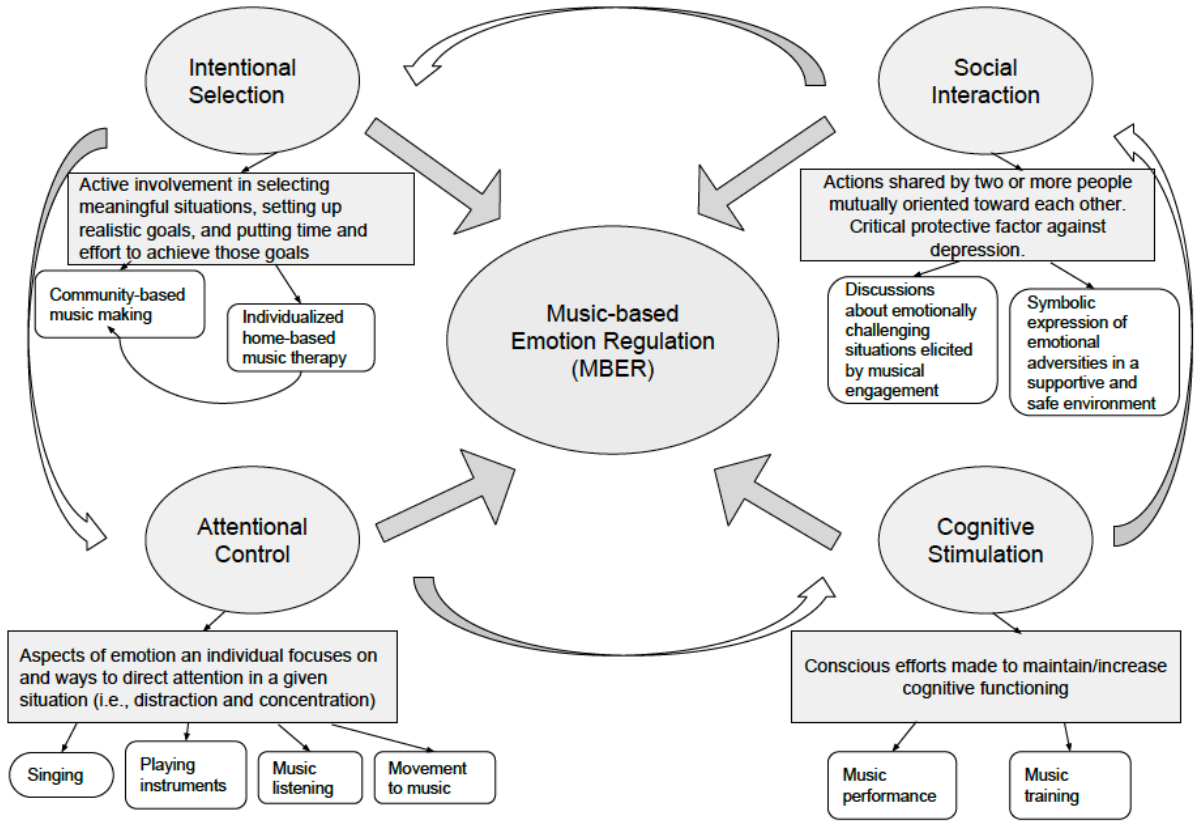


Figure 3. Music-based Emotion Regulation (MBER) model
Source: Adapted from Jang (2016b)

Intentional Selection. Intentional Selection refers to "how one decides which situations to select, how to set up and achieve goals, and what strategies to use to compensate for age-related physical, cognitive, and psychosocial losses" (Jang, 2016b, p. 10). Music therapists provide community-oriented music experiences that older adults select and actively engage in to expand their cognitive and socioemotional resources by using internal (i.e., ability to predict emotional outcomes in a particular situation) and external (i.e., ability to select social relationships that bring positive experiences) resources (Baltes & Baltes, 1990; Jang, 2016b). Active involvement in community-based music making is associated with feelings of control and autonomy, social affirmation, and a sense of purpose (Creech, Hallam, Varvarigou, McQueen, & Gaunt, 2013); thus, it is the therapist's role to create emotionally

challenging yet safe places for community dwelling older adults to become invested in taking an active position in decision making and problem solving, which may contribute to building a reservoir of resources to use for a desired emotional state (Hallam, Creech, Varvarigou, & McQueen, 2012).

For individuals who do not have cognitive capacities to expose themselves to socially complex situations, music therapists provide individualized home-based care tailored to their unique needs through which older persons build rapport with the therapist, engage in music experiences in a supportive therapeutic relationship, and work toward meaningful emotional goals (Jang, 2016b). Involving family members in psychoeducational activities, as well as music making experiences, may also help older adults gain feelings of empowerment in working toward the identified goals, get outside of the home, and participate in community-based activities.

Attentional Control. Once an individual selects emotionally meaningful situations, the person practices attentional control. Attentional Control refers to "which aspects of emotion a person focuses on and how people direct their attention within a given situation to alter their emotional experiences" (Jang, 2016b, p. 12). One may use distraction strategies to direct his or her attention away from a negative situation (e.g., loss of a friend) or change internal focus to something irrelevant to the situation to decrease the emotional impact, whereas others may use concentration strategies by focusing on specific features of an emotional situation (Gross, 1998). Within this component of the model, music therapists create music-based experiences that utilize singing, improvising, and movement to music so that older persons practice increasing attentional capacity by exercising sustained attention to sounds and actions within a therapeutic relationship (Jang, 2016b). Emotion regulation through optimal attentional control can be achieved through enhancement of sustained

attention that may involve sensory processing of music elements and "musical communication" between the client and the therapist (Swaine, 2014, p. 856).

If attentional focus is constantly directed toward negative feelings (i.e., rumination), it can have a detrimental effect on a person's psychosocial well-being (D'Hudson & Saling, 2010). However, older adults tend to seek emotionally meaningful situations due to limited life span, thus it may be beneficial to provide individual and/or group music experiences that direct older adults' attention to positive and emotionally meaningful circumstances rather than negative ones (Baltes & Baltes, 1990; Jang, 2016b).

Cognitive Stimulation. When an individual gains increased attentional capacities, Cognitive Stimulation, the third component of the MBER model is introduced. Cognitive Stimulation refers to "conscious efforts made to improve or maintain cognitive functions such as memory, concentration, reasoning, and decision-making" (Jang, 2016b, p. 13). Having high cognitive function is closely related to emotional well-being and an important marker for healthy aging (Fernandez-Prado, 2011; Payne et al., 2012; Rowe & Kahn, 1997; Woods, Aguirre, Spector, & Orrell, 2012). Despite negative perceptions about aging associated with cognitive decline, intellectual stimulation has a positive impact on maintaining cognitive performance in later life (Woods, Aguirre, Spector, & Orrell, 2012). Thus, Cognitive Stimulation attempts to challenge older adults at an intellectual level through active learning and reminiscence (Jang, 2016b).

Music requires complex sensory and cognitive processing of successive music elements such as rhythm and melody, which demands order, succession, and temporal relationship among the music elements. Cognitive Stimulation utilizes this cognitively demanding nature of music processing, and active learning is to preserve or maintain cognitive functioning of older persons in this component of the MBER model (Jang, 2016b).

Based on an individuals' musical background and cognitive ability, music therapists are encouraged to create an optimal learning environment in which older persons feel mutually respected, have the opportunity to actively participate in decision making processes (e.g., song selection) and clearly share motivation and strategies to learn new information (Reifinger, 2016). Also, it is important to create a learning environment in which older adults experience increased self-efficacy in memory as it impacts performance outcomes in goal-directed cognitive exercises (Payne et al., 2012; Roulston, Jutras, & Kim, 2015).

Social Interaction. After experiencing cognitively challenging yet mood enhancing music engagement, older adults are introduced to the most complex area of the MBER model, Social Interaction. Social Interaction is about actions shared by two or more people and serves as a critical protective factor against depression (Jang, 2016b). In this social component of the MBER model, music functions as a medium that naturally encourages building meaningful relationships and creating a social outlet through which older persons engage in reciprocal music interactions characterized by shared symbolic expressions of and discussions about emotional adversities that encourage empathy, interpersonal emotion regulation, sense of belonging, and acceptance of self.

Music therapists can facilitate these reciprocal music interactions by having clients share the same musical contexts through mirroring of one's emotional expressions and mimicking expressive musical cues to build social support as a bottom up approach. Individuals with depression often experience negatively biased emotion (Eerola & Vuoskoski, 2013); thus, older adults may achieve emotional clarity by articulating what was experienced during the emotional expression through music in a group environment where empathy is shared. Also, they may reappraise current emotional challenges through the presence of others and eventually achieve decreased depressive symptoms as a top-down approach.

Additionally, music therapists are encouraged to create music-based reminiscence experiences in which older adults' life experiences and memories are shared and validated in social context. Music-based reminiscence was placed under Cognitive Stimulation when the MBER model was originally constructed (Jang, 2016b). However, after careful examination of the nature of each component of the MBER model, the author modified the model and matched music-based reminiscence with Social Interaction, not with Cognitive Stimulation as reminiscence experience is more closely related to interpersonal emotion regulation than intellectual stimulation in the client context that the model targets (i.e., typically aging older adults with depressive symptoms).

Neurological Underpinnings of Emotion Regulation and Music.

In an attempt to make a parallel relationship between non-musical behavior (i.e. emotion regulation) and musical behavior (i.e., music listening and instrument playing), Jang (2016b) synthesized literature that identified brain areas that are associated with emotion regulation and music experiences that activate those brain areas. Emotion regulation is characterized by increased activation in cognitive controlling and monitoring areas such as anterior cingulate cortex (ACC), orbitofrontal cortex (OFC), and lateral prefrontal cortex (PFC) and decreased activation in areas associated with emotional reactivity such as the amygdala (Sena Moore, 2013). In other words, emotion regulation is the interplay between cognitive monitoring and controlling and emotional reactivity.

In a systematic review of literature focusing on neural substrates of music on emotion regulation, Sena Moore (2013) synthesized outcomes found in neuroscience literature that includes fMRI, PET, and EEG studies and identified music experiences that activate the aforementioned areas associated with emotion regulation. According to this systematic review, when individuals listen to pleasant or happy music, they experience an increased activation in the anterior cingulate cortex (ACC), orbitofrontal cortex (OFC), and prefrontal

cortex (PFC), and decreased activation in the amygdala (Blood & Zatorre, 2001; Jang, 2016b; Koelsch, 2014; Koelsch, Fritz, Cramon, Muller, & Friederici, 2006; Limb & Baun, 2008). Similar activation patterns were reported when listening to music, regardless of the emotional meaning to the listeners, and when singing and improvising (Sena Moore, 2013).

Listening to pleasant or happy music and engaging in musical improvisation share the same brain areas associated with emotion regulation. Therefore, evidence suggests a parallel relationship between emotion regulation and music and such music engagement has the potential to function therapeutically in emotion regulation processes (Jang, 2016b). This parallel relationship provides neurological support from basic science research for the MBER model (de L'etoile, Dachinger, Fairfield, & Lathroum, 2012).

Review of Existing Interventions and Measurement Tools

According to the preventive intervention research cycle illustrated in Figure 2, reviewing interventions both inside and outside prevention research is a necessary step in developing preventive interventions (IOM, 1994). In this section of the chapter, the author reviews evidence-based non-music approaches that target depression treatment and prevention as well as music approaches that aim to decrease depressive symptoms in older adults. Preventive programs target individuals who are at risk of developing a clinically significant disorder; thus, the author describes measurement tools that allow screening of such individuals as well as evaluation of intervention outcomes. These described tools have been tested for reliability, validity, sensitivity, and specificity.

Non-music approaches. The CDC and the National Association of Chronic Disease Directors (NACDD) recognizes the importance of increasing public awareness that depression can be effectively treated through community-based programs and introduces evidence-based depression treatment programs (CDC, 2008). The following three programs are recommended by the CDC and NACDD, and have been successfully replicated in

community settings: Program to Encourage Active, Rewarding Lives for Seniors (PEARLS), Improving Mood-Promoting Access to Collaborative Treatment (IMPACT), and Healthy IDEAS (Identifying Depression, Empowering Activities for Seniors).

PEARLS is a home-based depression treatment intervention that uses problem-solving treatment (PST), social and physical activation, and pleasant event planning and scheduling (CDC, 2008). PST is based on a premise that systematically identifying and addressing problems that individuals face in everyday lives can lead to decreased depressive symptoms (Ciechanowski et al., 2004). In the PEARLS intervention, social activation was facilitated to help older adults experience social interaction outside home, and group activities that encourage peer support were given the highest priority. Physical activity was also organized to help participants engage in a regular physical activity program that was guided by national recommendations. The intervention consisted of eight 50-minute sessions over 19 weeks followed by subsequent telephone contacts. To determine the effectiveness of the PEARLS intervention, Ciechanowski et al. (2004) conducted a randomized controlled trial with older adults with minor depression or dysthymia and found that the group who received the treatment experienced at least a 50% reduction in depression symptoms compared to a group who received usual care. Additionally, 36% of the treatment group achieved complete remission and a significant group difference was reported on functional and emotional well-being.

IMPACT is a team-based collaborative depression treatment intervention that targets older adults with major depression or dysthymia in primary care settings. IMPACT is characterized by education, behavioral activation such as physical activity and activity scheduling, and relapse prevention for those who show symptom reduction. In a randomized controlled trial, Hunkeler et al. (2006) provided the IMPACT intervention to older adults from 18 primary care clinics and reported that treatment groups showed significantly better

results in depressive symptoms, continuation of antidepressant treatment, physical functioning, quality of life, self-efficacy about confidence in managing depression, and satisfaction with care. Also, the researchers reported that the result of the IMPACT intervention persisted at least one-year post completion of the intervention.

Healthy IDEAS is another community-based program designed to detect and decrease depressive symptoms among elderly yet differs from PEARLS and IMPACT in that the intervention was provided by case managers in community agencies, not by mental health professionals trained solely for implementation of an intervention. The intervention included education (e.g., role of meaningful activities and self-care strategies), assessment of mood, identification of activities that fit with an individual's life values in various domain areas, and monitoring of an individual's progress implementing activity goals. Quijano et al. (2007) investigated the effectiveness of the intervention with high risk community-dwelling older adults and reported a significant reduction in depression and pain severity, positive changes in mood, and increased knowledge about how to get help for depression even after six months of receiving the program. However, generalizability was limited due to lack of control group.

All three evidence-based programs described above share qualities that seem important to intervention success. These qualities are that (a) all three community-based interventions used behavioral activation, which reflects the fact that the cognitive behavioral approach is the most commonly used form of depression treatment targeting older adults; (b) intervention delivery was adhered to based on a treatment manual to ensure fidelity; (c) education about depression and how to successfully practice new skills was provided at the initial phase of intervention delivery; (d) follow-ups were done through various forms such as telephone communication and relapse prevention; and (e) collaboration among various entities such as program providers, case managers, psychiatrists, and community agencies seemed to play a crucial role in participant recruitment, intervention delivery, and successful

implementation of the interventions (Ciechanowski et al., 2004; Hunkeler et al., 2006; Quijano et al.,2007).

In a preventive framework, indicative interventions that are oriented in the cognitive-behavioral approach, life review, and psychosocial interventions have shown intervention effectiveness. The author reviewed four types of preventive interventions that showed promising results: Stepped-Care, Coping with Depression (CWD), Looking for Meaning, and various psychosocial interventions that were reviewed by Forsman, Schierenbeck, and Wahlbeck (2011). Stepped-Care, CWD, and Looking for Meaning are preventive approaches that have shown intervention efficacy in preventing late-life depression and are recommended by the CDC for community-based use. Forsman, Shierenback, and Wahlbeck (2011)'s synthesis of psychosocial interventions describes elements that seem to contribute to positive outcomes associated with decreased depressive symptoms.

Stepped-Care is an indicated preventive intervention that focuses on cognitive-behavioral techniques that are characterized by four steps of care: watchful waiting, brief cognitive behavior therapy-based bibliotherapy (i.e., planned reading program with a specific therapeutic purpose), cognitive-behavior therapy-based PST, and referral to a primary care physician (van't Veer-Tazlaar et al., 2009). In the initial phase, individuals with subthreshold depressive symptoms were selected over a three-month period to exclude those whose symptoms disappear spontaneously (i.e. watchful waiting). A trained nurse provided cognitive behavior therapy based bibliotherapy and offered information about a depression and anxiety self-help course that was designed to help older adults improve social skills, address thought patterns, and increase pleasant activities and relaxation to better cope with depressive symptoms. Trained nurses also provided brief cognitive behavioral therapy based PST that focused on practical skill building to help individuals regain control over their lives. Fidelity was monitored through tape recording. In the last step, individuals who continued to

show an elevated depression score were monitored and received written advice to discuss with primary care physicians. The Stepped-Care intervention decreased the incidence of depressive and anxiety disorders by half, suggesting that indicated interventions such as the Stepped-Care preventive intervention can be effective in reducing the risk of developing depression in older persons.

Coping with Depression (CWD) is a highly structured cognitive-behavioral approach that focuses on psychoeducation (Lewinshon, 1975). An important characteristic of the CWD is that participants learn a series of skills that may help them to cope with depressive symptoms through social skill building and cognitive reconstruction. In the CWD intervention, participants play an active role in collecting information on the subject matter (i.e., negative thought, pleasant/unpleasant events, and social events), setting a goal, and developing a systematic plan to reach the goal (Cuijpers, Munoz, Clarke, & Lewinsohn, 2009; Lewinsohn, 1975). Efficacy of the CWD intervention has been tested in many studies in diverse populations and settings and among those, Cuijpers et al. (2009) reported that individuals who received the CWD showed 38% less chance of developing a depressive disorder than who were in the control group. Psychoeducation can be delivered through various forms including books, media, individual/group or self-help format. More recently, internet-based CWD intervention was delivered to older adults with subthreshold depression and showed intervention efficacy as well as carry-over effect one-year post intervention implementation (Spek et al., 2008)

Based on the premise that reminiscence serves three major functions: self-functions characterized by coherence, meaningfulness, and continuity of the self; guidance characterized by shared and recalled knowledge and experience; and intrinsic link to emotions characterized by interpersonal emotion regulation (Cappeliez, O'rourke, & Chaudhury, 2005), Pot et al. (2010) conducted an indicated preventive intervention called,

Looking for Meaning. Looking for Meaning is a structured reminiscence intervention that includes sensory recall exercises (i.e. smells from the past), creative activities, and verbal discussion. The results showed that older adults with subsyndromal depressive symptoms experienced significant reduction in depressive symptoms and the symptom reduction was retained during six months follow-up post treatment.

Forsman, Schierenbeck, and Wahlbeck (2011) conducted a systematic review of the literature that examined the efficacy of psychosocial interventions within the preventive framework. Synthesis of these results indicated that interventions that focused on social activities in which older adults had an active role in meaningful social involvement tailored to individuals' abilities, preferences and needs showed statistically significant results. Psychosocial interventions that were relatively longer with more frequent delivery than a few weeks also showed significant outcomes in decreasing depressive symptoms.

In summary, interventions that have shown effectiveness in decreasing depressive symptoms of older persons in treatment and prevention involve cognitive behavioral approaches that are characterized by active participation in goal setting and problem solving, psychoeducation regarding how to strategically solve the problem, and social skill building that involves peer support. Reminiscence interventions that focus on meaningfulness through interpersonal emotion regulation, and psychosocial interventions in which individual values and needs are taken into consideration in meaningful social activities have also shown promising results in addressing depressive symptoms in older persons.

Music approaches. Theoretical mechanisms of how music, particularly music listening, may induce emotions of a listener have been studied in music psychology and music therapy (Juslin & Slobada, 2010; Slobada & Vastfjall, 2008; Thaut, 2005). However, how music interventions may address emotional needs of the older adult population has not been well defined; thus, Jang (2016a) conducted a systematic review summarizing and

synthesizing characteristics of music-based interventions, emotion related goals, and population profiles.

According to this systematic review (Jang, 2016a), depressive symptoms were the most frequently addressed outcomes in the emotional domain for older adults with all studies that addressed depressive symptoms reporting statistically significant symptom reduction. Interventions identified in this systematic review included combinations of various types of traditional music experiences such as singing, instrument play, listening to music, and music-based reminiscence. The majority of interventions used music that was familiar to and/or preferred by participants. Interesting findings in the systematic review were that (a) 88% of reviewed studies were conducted in international locations including South Korea, Singapore, and Germany; (b) 88% of identified studies were completed with patients with dementia; and (c) although all studies included in the review reported positive emotional outcomes, poor intervention reporting and lack of details of the specific characteristics of music made it difficult to understand and evaluate the music interventions delivered to older adults for the purpose of addressing emotional needs.

Among these music interventions delivered by credentialed music therapists, the following is an overview of the intervention studies that specifically focused on depressive symptoms of older adults that have shown intervention efficacy. The majority of these interventions targeted patients with dementia and they were conducted in international locations. Although it is hard to find a general pattern due to the heterogeneity in population characteristics, these studies may provide emerging evidence and intervention characteristics that support the use of music in the context of depressive symptom reduction in the older adult population (see Table 4 for a summary of the following reviewed articles).

Ashida (2000) conducted a music-based intervention that primarily focused on reminiscence with patients with dementia in two residential facilities in Canada for three

weeks and found a significant decrease in depressive symptoms. Similarly, Choi, Lee, Cheong, and Lee (2009) conducted a small-scale intervention study with patients with dementia in a day care unit in South Korea and used various music experiences such as instrument play, movement to music, and music listening. Despite poor intervention reporting, the study showed positive outcomes in reducing depressive symptoms.

Han et al. (2010) conducted a multi-componential intervention called Music Therapy and Activities Program that included a combination of music experiences, exercise, and gardening in individuals with dementia in an outpatient dementia clinic in Singapore. After receiving weekly, six-hour sessions for eight weeks, the participants showed significant decreases in depressive mood and behaviors.

Raglio et al. (2015) conducted a randomized controlled trial on patients with dementia in Italian nursing homes. The researchers compared active music therapy characterized by singing and instrument improvisation, music listening characterized by listening to music from preferred song lists without interaction with a therapist or a caregiver to control, and standard care group who received educational, occupational, and physical activities. All groups showed significant changes in depression symptoms but no significant group differences were found among the three groups.

Chu et al. (2014) modified a previously developed intervention protocol and conducted a randomized controlled trial of 104 older adults with dementia from three nursing homes in Taiwan. The intervention included music and movement, instrument play, listening to popular music, singing, and music-guided reminiscence, and reported improvements in depressive symptoms as well as cognitive functions.

Mohammadi, Shahabi, and Panah (2011) conducted an intervention study with patients with dementia in a nursing home in Iran and used classical as well as traditional instruments (i.e., Daf, Tombak) in various music experiences. Popular songs and theme-based

songs that focus on emotions were also utilized in the intervention delivery. After receiving a 10-week set of music therapy sessions, the researchers reported significant decreases in depression and anxiety scores in the intervention group when compared to the controlled group.

Hanser and Thompson (1994) provided home-based music therapy that specifically focused on music listening, guided imagery, and relaxation in the US. Participants were randomly assigned to either music listening group in which individuals received eight, one-hour weekly home visits or to the self-administered music therapy group in which participants engaged in daily music listening at participant chosen times and a weekly 20-minute telephone conversation with the therapist. Both groups differed in depression scores from the wait list control but no differences were found between home-based and self-administered conditions.

In summary, despite lack of transparent reporting of intervention characteristics, engaging in music experiences - including active music therapy and music-based reminiscence - has shown positive results in decreasing depressive symptoms in diverse settings across cultures. Also, the reviewed studies suggest that listening to music that is tailored to individual preference and self-administered music listening can be used as viable emotion regulation strategies in reducing depressive symptoms of older adults.

Table 4

Summary of the Reviewed Articles using Music Approaches Adapted from Jang (2016a)

Author	Study design	Participant characteristics	Duration/ frequency of intervention delivery	Types of music experiences	Description of music	Outcomes	Measures
Ashida (2000)	1-group pre-posttest design	20 individuals with dementia (73-94 yr; M=86.2 yr) in two residential care facilities in Canada	Sessions facilitated at the participants' residential settings Sessions were provided for 3 weeks. Average duration of each session: 42.95 minutes	Group MT (4 intervention groups total) Reminiscence (primary component) Drumming Singing	Instruments: 1 classical acoustic guitar, 1 small African drum Songs: collection of songs from the period between 1890s and 1930s; and familiar songs related to the theme of the day	Significant decrease in depressive symptoms after receiving 5 days of reminiscence focused MT sessions Observation data showed significant mood improvement right after MT sessions.	Cornell Scale for Depression in Dementia Behavioral observation
Choi, Lee, Cheong, & Lee (2009)	2-group non-randomized design	20 patients with dementia (62.7-83.7 yr; M=74.9 yr) in a special dementia day care unit in South Korea	50 minute music intervention was provided 3 times a week for 5 consecutive weeks	Instrument play Movement Singing Making simple instruments Listening to songs	No detailed description about music characteristics	Depressive symptoms significantly improved in the music intervention group Significant improvement in depression, anxiety, and irritability with regard to caregivers' distress	Mini-Mental State Examination Geriatric Depression Scale Geriatric Quality of Life Neuropsychiatric Inventory-Questionnaire
Chu et al. (2014)	2-group randomized controlled trial	104 older adults with dementia (65 yr or above) from three nursing homes In Taiwan	30 min sessions were provided 2 times a week for 6 weeks	Group MT Protocol: modified version of Clair & Berstein (1990) Music and movement Instrument play Listening to popular music Singing with instrumental	Instruments: triangles, clappers, maracas, handbells, and tambourines Music choice was related to traditional	Improvements in depressive symptoms after music intervention No significant differences on salivary cortisol level between experimental	Chinese version of the Cornell Scale for Depression in Dementia Mini-Mental State Examination Salivary cortisol level

				accompaniment Music-guided reminiscence	festival	and control groups Improvement in cognitive functions with persons with mild and moderate dementia	
Han et al. (2011)	2-group non-randomized wait-list control trial	43 individuals with dementia (69.4-87.6 yr; mean=78.3 yr) from an outpatient dementia clinic in Singapore	A weekly, 6 hour MT session delivered for 8 weeks	Group MT (8 individuals in a group) Music Therapy and Activities Program (MAP) included music, exercise, gardening, horticulture, and reminiscence Music experience included singing, music and movement, and instrument play	No detailed description about music characteristics	Depressive mood and behaviors significantly decreased after intervention	Apparent Emotion Scale-Revised Memory and Behavioral Problems Checklist
Hanser & Thompson (1994)	3-group randomized waitlist control trial	30 older adults (61-86 yr; mean=67.9 yr) diagnosed with major or minor depressive disorder	Home-based MT group: received one-hour 8 weekly home visits Self-administered MT group: Daily music listening at a participant chosen time and weekly 20 minute phone conversations	Music listening protocol included progressive muscle relaxation, guided imagery, deep relaxation, and listening with other art forms	Energetic music Relaxing music Slow and repetitive music Rhythmic music	Two music conditions on all measures differed from the wait list control. No difference was found between home-based and self-administered conditions	Geriatric Depression Scale Brief Symptom Inventory Self-Esteem Inventory Profile of Mood States-Bipolar Form
Mohammad, Shahabi, & Panah (2011)	2-group randomized controlled trial	19 elderly (>65 yr; M=69.47 yr) in a nursing home in Iran with illnesses ranging from dementia to chronic physical disease	Daily 90 minute sessions for 10 weeks	Group MT Listening to music Singing Instrument play Movement to music Reminiscence, Visualization	Classic and traditional instruments (i.e., Daf, Tombak, Maracas) Popular songs Songs about fears, hates, and worries	Significant decrease in anxiety, stress, and depression reported in the intervention group	Depression and Anxiety Stress Scale

					Singing romantic poems		
Raglio et al. (2015)	3-group randomized controlled trial	120 patients with moderate to severe dementia (73.4-89.2 yr) and psychological symptoms living in 9 Italian nursing homes	Active MT group: 20 individualized 30 minute MT sessions Music listening group: twice a week listening sessions were provided for 10 weeks	Active MT group: singing and instrument improvisation Music listening group: preferred playlist without interaction with a therapist or a caregiver Standard care group: educational, occupational, and physical activities	Melodic and rhythmic instruments Emotional expression and modulation through singing and instrument play	All groups showed significant improvement over time in behavioral and psychological symptoms including depression and quality of life but no significant group differences were found among the three groups	The Neuropsychiatric Inventory Cornell Scale for Depression in Dementia Cornell-Brown Scale for Quality of Life in Dementia Music Therapy Check List-Dementia

Standardized measurement tools. Although there is a plethora of measurement tools, the best screening tool is one that accurately differentiates those individuals with and without depression (Berman & Furst, 2010). Besides just evaluating validity and reliability, one must consider sensitivity and specificity when determining which screening tools are appropriate for chosen participants (Berman & Furst, 2010). A measurement tool that has good sensitivity is one that correctly identifies individuals with depression whereas a measurement tool that has good specificity is one that correctly identifies individuals without depression (Lewinsohn, Seeley, Roberts, & Allen, 1997). The following are screening tools that have been widely used in mental health research and clinical practice with tested sensitivity and specificity. Summary of the depression tools can be found in Table 5.

Center for Epidemiologic Studies Depression Scale (CES-D). CES-D is a 20-item measure that asks individuals to rate depressive symptoms in five psychometric categories of depressed mood, feelings of worthlessness, feelings of hopelessness, loss of appetite, poor concentration, and sleep disturbance. The CES-D provides a cut-off score that helps identify individuals who are at risk of developing depression (Lewinsohn, Seeley, Robers, & Allen, 1997; Radloff, 1997). The CES-D is the most widely used depression screening instrument in community-based studies (Gotlib & Cane, 1989). It is a short screening tool and it takes about ten minutes to complete and is available in multiple language formats that include Korean, Japanese, and Spanish (Berman & Furst, 2010). However, the CES-D has limitations in that (a) studies show mixed results in demonstrating its reliability and validity; (b) the tool does not include assessment of suicidality; and (c) it focuses on symptoms that were present only during the past week.

Geriatric Depression Scale (GDS). GDS is a popular measure used to screen depression in the elderly population (Yesavage et al., 1983). The GDS has a 30-item questionnaire and provides force choice response (yes/no) that requires little cognitive

involvement (Lopez, Quan, & Carvajal, 2010). GDS can be self-administered or used as an interview. More recently, a 15-item version of the GDS (GDS-15) demonstrated its overall effectiveness in detecting elderly with depressive symptoms in the community (Conradsson, et al., 2013; Shoevers et al., 2006). The GDS is useful in monitoring changes in symptoms over the course of treatment and is available in 28 different languages including Korean, German, and Spanish. This tool is in the public domain; both long and short formats, as well as different versions based on language choice, can be found from Aging Clinical Research Center at the Stanford University (see at http://web.stanford.edu/~yesavage/GDS.html). The tool has undergone rigorous testing and has shown excellent reliability, validity, and high sensitivity (Ertan, Ertan, Kiziltan, & Uygucgil, 2005; Malakouti, Fatollahi, Mirabzadeh, Salavati, & Zandi, 2006; Sheikh & Yesavage, 1986). One limitation of the GDS is that it involves symptom experiences within the past week and lacks inclusion of questions related to suicidal ideation (Berman & Furst, 2010).

Patient Health Questionnaire (PHQ-9). PHQ-9 has nine questionnaires that directly respond to nine symptoms specified in the DSM-IV and can be used for screening as well as for reporting treatment efficacy (Chen, Huang, Chang, Chung, 2006; Kroenke & Spitzer, 2002; Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004). A shorter version, PHQ-2, is also available in cases where there is a need for screening a large number of people with few resources. PHQ-9 is available in more than 25 languages. Strengths of this tool lie in its (a) good overall sensitivity and specificity; (b) multiple formats of administration such as face to face and telephone interviews, and self-administration; (c) utility in both assessment and treatment; and (d) inclusion of questions related to suicide (Berman & Furst, 2010). Although it requires permission to use, PHQ-9 is also in the public domain and is available at the Mapi Research Trust (see https://eprovide.mapi-trust.org/instruments/patient-health-questionnaire).

Beck Depression Inventory (BDI). BDI was originally designed to be administered by health care professionals but it has evolved as a self-administered instrument (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). One strength of this tool is that it not only provides the cut off score for varied levels of depression but also differentiates different subtypes of depression such as major depressive disorder and dysthymia (Berman & Furst, 2010). The BDI is a short screening tool that can be completed within 5-10 minutes.

Table 5

Summary of Measurement Tools Used to Screen Depressive Symptoms in Older Persons

	CES-D	**GDS**	**PHQ-9**	**BDI**
Description	20 item measure Mostly widely used in community-based studies Available in multiple languages	30 item measure Self-administered or used as an interview Force choice response (yes/no) Requires little cognitive involvement A shorter version, GDS-15 is available Available in multiple languages	9 item measure 9 items directly related to symptoms in DSM-IV A shorter version, PHQ-9 is available in multiple languages	21 item measure Self-administered A revised version, BDI-Ⅱ (i.e. revised version) is available
Strengths	Provides cutoff scores that help identify individuals who are at risk for clinical depression Short and can be completed within 5-10 minutes. Has good sensitivity and specificity with high internal consistency	Useful in monitoring changes in symptoms Undergone rigorous testing Excellent reliability, validity, sensitivity Public domain	Good overall sensitivity and specificity Multiple formats of administration (i.e., phone interview, self-administration) Inclusion of questions related to suicide Public domain	Provides the cut-off score for varied levels of depression Differentiates subtypes of depression Can be completed within 5-10 minutes
Limitations	Mixed results in reliability and validity Suicidality is not measured Focuses on present symptoms only during the past week	Involves symptoms experienced within the past week No inclusion of questions related to suicidal ideation	High false negative rates (i.e., limitation in detecting clinical cases)	Reliance on physical symptoms may inflate scores due symptoms of the illness
Access	http://www.chcr.brown.edu/pcoc/cesdscale.pdf	http://web.stanford.edu/~yesavage/GDS.html	https://eprovide.mapi-trust.org/instruments/patient-health-questionnaire	https://www.bmc.org/sites/default/files/For_Medical_Professionals/Pediatric_Resources/Pediatrics__MA_Center_for_Sudden_Infant_Death_Syndrome__SIDS_/Beck-Depression-Inventory-BDI.pdf

Notes: CES-D = Center for Epidemiologic Studies Depression Scale, GDS = Geriatric Depression Scale, PHQ = Patient Health Questionnaire, BDI = Beck Depression Inventory

In summary, prevalence of late-life depression is rising as the world population experiences unprecedented growth in the number and proportion of the elderly. Depression in older persons is a result of dynamic interplay of various biological, psychological, and social factors; thus, interventions that address these factors that contribute to maladaptive emotion regulation in older adults who are at increased risk of developing depression may decrease depressive symptoms. In addition, music has shown potential to be used as a viable emotion regulation strategy in theoretical and basic science research as well as efficacy trials. Among these, the MBER model provides theoretical conceptualization of how music may be used in emotion regulation processes in the context of depression prevention in older adults. Therefore, the author created an intervention manual to articulate an intervention based on the MBER model. This intervention manual was developed by following a series of intervention and manual development processes using theory-based music selections situated within the phases of the author's established research line.

Therapeutic Function of Music Plan

Goal: To decrease depressive symptoms of older persons using the four emotion regulation strategies within the MBER model

Musical Element	Theoretical Framework	Purpose of Musical Element	Explicit Description of the Musical Element
Timbre: Attribute that allows identification between sounds having the same perceptual duration, loudness, and pitch, and often referred to as the color of sound (Patil, Pressnitzer, Shamma, Elhilai,& Theunissen, 2012)	➢ Early musical experience (e.g., piano lesson) is associated with enhancement of later musical engagement and musically satisfied contingency (Flowers & Murphy, 2001). ➢ Piano is an instrument that older adults are the most familiar with (Flowers & Murphy, 2001).	➢ Early music experience often involves music lessons. ➢ Utilization of timber by including instruments that are associated with early music lessons my help bring out past memories; thus it may contribute to engagement and motivation in music experience.	➢ Discuss early attachment to music to increase motivation and participation. ➢ Provide music experiences that utilize piano (e.g., accompaniment, music training). ➢ For those who do not have much musical memory, work on building relationship with music through various formats such as playing instruments and singing. ➢ Provide educational opportunities that have relevance to older adults' early memories with music.
	➢ Community choir provides performance opportunities for music that can be shared with the community, a vehicle for music education, a training ground for those with limited musical background, and an instrument for social change (Sayer, 2010).	➢ Community-based singing provides performance opportunities, education platform for those with and without much musical background, and social integration.	➢ Include community-based choir experience to create performance and educational opportunities, and social integration.

	➢ Playing instruments and singing requires sensory motor processing of the brain which may have a direct influence on sustained attention (Särkämö, Tervaniemi, & Huotilainen, 2013; Swaine, 2014).	➢ Utilization of timbre through various musical formats including singing and playing instruments may influence sustained attention. ➢ Systematic use of timbre (e.g., layering) may impact sensory motor processing and sustained attention.	➢ Use timbre to manipulate level of sensory processing that impacts sustained attention.
Rhythm: "Durational pattern that synchronizes with a pulse or pulses on the underlying metric level" (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016, p. 2)	➢ "Discernible temporal distribution and organization of events in groupings imposed by a rhythmic structure allow for better perceptual gestalts to emerge, minimizing conflict and difficulty in perception" (Thaut, 2005, p. 5).	➢ Rhythmic patterns allow organization and grouping of musical events that occur simultaneously.	➢ When engaging older adults in music making, establish good sense of rhythm for better organization and groupings of musical events for better perceptual and cognitive processing of music elements for sustained attention and efficient music learning.
	➢ Rhythm, especially in cyclical and periodic form creates anticipation and predictability (Huron, 2006; Thaut, 2005).	➢ Rhythmic patterns that are characterized by periodicity and repetition create predictability.	➢ Use rhythmic patterns that are cyclical and periodic to increase anticipation and predictability for optimal attentional control.
	➢ Syncopated rhythms are perceived as more fun and upbeat than non-syncopated rhythms, especially when a syncopated pattern is followed by a non-syncopated pattern, thus creating more complexity and excitement (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016; Keller & Schubert, 2011).	➢ Syncopated rhythms followed by non-syncopated rhythms create more complexity and excitement.	➢ Use syncopated rhythms followed by non-syncopated rhythms to increase excitement and energy.

	➢ Attunement (i.e., interactive attending) involves "synchronous interplay between an attender and an event in which the former comes to partially share the event's rhythmic pattern" (Jones & Bolts, 1989, p. 470).	➢ Rhythmic patterns allow interactive attending between an attender and a musical event.	➢ Facilitate rhythmic patterns that are easily shared by the individuals who attend to a musical event in which those rhythmic patterns are embedded.
	➢ Perception of rhythm is highly dependent on metrical prior so that the brain maximizes successful prediction by expecting rhythms to be within a specific matric quality (i.e., duple meter) (Vuust & Witek, 2014).	➢ Perception of rhythmic pattern in relation to metric quality increases brain efficiency in processing music through successful prediction.	➢ Introduce rhythm in relation to metric quality to increase brain efficiency in rhythm perception.
	➢ Movement to music may be partially associated with reduction in depressive symptoms (Choi, Lee, Cheong, & Lee, 2009; Chu et al., 2014; Mohammadi, Shahabi, & Panah, 2011).	➢ Movement to music that utilizes rhythm patterns in an effective way may help decrease depressive symptoms.	➢ Utilize movement to music to improve mood.
	➢ Music training increases memory, visuospatial abilities, socioemotional abilities, and executive functions (Schellenberg & Weiss, 2013)	➢ Musical training that involves building rhythmic foundations may increase many cognitive skills including memory and executive functioning, and socioemotional abilities.	➢ Engage older adults in music training that uses efficient processing of music elements (i.e., building rhythmic foundation).
	➢ Older adults need more trials when processing complex rhythms (Reifinger, 2016).	➢ Strategic music training such as more repetition with emphasis on short phrases may facilitate processing of complex rhythms in older adults.	➢ During music training involving older adults, (a) allow more time to practice learning new skills; (b) provide opportunities to practice motor patterns when engaging them in instrument performance; and (c)
	➢ Older adults may benefit from practicing motor patterns associated with music learning that involves		

	fine motor skills in short phrases as a single integrated unit (Reifinger, 2016).		focus on short phrases as a unit instead of individual notes to increase practice efficiency.
	➢ Motor synchronization to rhythmic patterns in music is associated with evoked experience, especially when music evokes feelings of power and triumph (Vuilleumier & Trost, 2015).	➢ Synchronized movements to rhythm may evoke feelings of power and triumph.	➢ Include motor synchronization to rhythm when intending to increase feelings of power and triumph.
	➢ Engaging in musical behavior requires attention and working memory system that is spread over many prefrontal areas (Särkämö, Tervaniemi, & Huotilainen, 2013). ➢ Perceiving rhythm involves sensory motor processing which may have a direct association with sustained attention (Sarkamo, Tervaniemi, & Huotilainen, 2013; Swaine, 2014).	➢ Music engagement stimulates attention and working memory system. ➢ Rhythm perception involves sensory motor processing and sustained attention.	➢ Manipulate rhythmic complexity (i.e., from simple to complex) to facilitate optimal sensory motor processing. This sensory motor processing may subsequently lead to increased sustained attention within the context of music, therapist-client relationship, and relational reciprocity among clients who share the same rhythmic quality.
Tempo: Speed of a composition's rhythm and is measured according to beats per minute (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016)	➢ Allows individuals to perceive music in an organized manner and forms basis for melodic and harmonic lines (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016).	➢ Tempo allows organization in music perception and functions as foundation for melodic and harmonic progression.	➢ Set clear tempo so that attenders perceive music in the most organized manner and to better establish harmonic and melodic lines.
	➢ Psychophysical attributes of music that drives energy dimension are tempo,	➢ Tempo allows dynamic energy flow. ➢ Tempo affects emotional valence and	➢ Manipulate tempo to facilitate different emotional valence and arousal (e.g., faster

	intensity, waveform, timbre, and rate change (Thaut, 2005). ➢ Increase in tempo is associated with increased feelings of happiness, surprised, tension, expressiveness, and amusement, and decreased feelings of sadness. (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016) ➢Fast tempo is associated stronger arousal value (Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016).	arousal level. ➢ Changes in tempo evoke different feelings.	tempo-stronger arousal) ➢ Use increased tempo for expressiveness and decreased tempo for feelings of sadness.
	➢ Once reference level attunement is established through meter and rhythmic pattern, then attentional shifts may occur to musical qualities that require more effortful attending such as shorter time period (Jones & Bolts, 1989).	➢ Faster tempo facilitates more effortful attention.	➢ Establish basic meter and rhythmic pattern then introduce more complex form of tempo (i.e., faster tempo) for optimal attentional shift.
	➢ Older adults experience greater decrease in rhythmic accuracy at faster tempo compared to younger adults (Reifinger, 2016).	➢ Tempo affects rhythmic accuracy.	➢ When practicing songs that are faster and rhythmically asymmetrical, give older adults enough time to practice to build rhythmic accuracy.
	➢ Tempo provides underlying social interaction as individuals share the same musical event (Scollon, 1982 as cited in Fernandez-Sotos, Fernandez-Caballero, & Latorre, 2016).	➢ Tempo provides underlying social mechanism that is shared by individuals who attend the same musical event.	➢ Allow tempo to be consistently and easily shared by older adults who attend the same musical event. ➢ Manipulate tempo to influence dynamics of relational reciprocity among older adults.

Pitch: "Perceptual correlate of periodicity in sounds" (McDermott, & Oxenham, 2008, p. 452)	➢ Upward pitch contour is associated with feelings of fear, surprise, anger, potency, and happiness whereas downward pitch contour is associated with sadness, boredom, and pleasantness (Gabrielsson & Lindstrom, 2010).	➢ Upward and downward pitch contour creates different emotional expression. ➢ Pitch distinguishes highness and lowness of a tone.	➢ Manipulate pitch contour to facilitate different emotional experience (e.g., upward contour-happiness, downward contour-sadness) movement.
	➢ High pitch level creates gaiety, surprise, potency, happiness, fear, and increased tension arousal whereas low pitch level creates seriousness, sadness, solemnity, boredom, pleasantness, and increased valence (Gabrielsson & Lindstrom, 2010).	➢ High and low pitch level creates different emotional expression and arousal. ➢ Upward and downward pitch contour creates different emotional expression.	➢ Match highness and lowness of pitch to desired valence and arousal level (e.g., high-gaiety and tension arousal, low-seriousness and sadness). ➢ Manipulate pitch contour to facilitate different emotional experience (e.g., upward contour-happiness, downward contour-sadness).
	➢ Most comfortable singing range for older adults is between F3 and C5 for women and an octave lower for men (Moore, Straum, & Brotons, 1992). ➢ However, they may also prefer singing songs or listening to music that are outside their comfortable singing range (Yinger & Springer, 2016).	➢ Providing singing range that older adults are comfortable to sing or challenged to sing may increase participation, motivation to learn music, and quality of social interaction.	➢ Use pitch range that is the most comfortable for older adults to sing (i.e., F3-C5 for women and an octave lower for men). Also, challenge them with songs that are outside their comfortable singing range.
	➢ Humans tend to associate increasing musical pitch with ascending objects and decreasing musical pitch with descending objects (Hedger, Nusbaum, Lescop, Wallisch, & Hoeckner,	➢ Listening to increasing/decreasing musical pitch creates mental image of an object ascending/descending.	➢ Match pitch contour and characteristics of movements (e.g., arms going up-upward pitch contour) ➢ Use ascending movements for increasing pitch and descending movements

	2013).		of decreasing pitch to teach basic music literacy.
	➢ High pitch level creates gaiety, surprise, potency, happiness, fear, and increased tension arousal whereas low pitch level creates seriousness, sadness, solemnity, boredom, pleasantness, and increased valence (Gabrielsson & Lindstrom, 2010).	➢ High and low pitch level creates different emotional expression and arousal.	➢ Match highness and lowness of pitch to desired valence and arousal level (e.g., high-gaiety and tension arousal, low-seriousness and sadness).
Melody: Sequence of phrased pitch changes (Jones & Boltz, 1989)	➢ Music evokes episodic memory of a listener, which is an important mechanisms of emotional response to music and often involve past and present social relationships (Juslin & Vastfjall, 2008).	➢ Melodic patterns may plan an important role in building association with episodic memory.	➢ Stay close to the original melody when using songs that facilitate reminiscence and social interaction.
	➢ Older adults are slower at reading music while performing fine motor tasks than younger adults and such latency mostly occurs during the premotor period (Reifinger, 2016). ➢ Older adults need more practice time to learn repeated tone sequences on keyboard than younger adults within and across days (Reifinger, 2016).	➢Learning melodies may involve longer practice time for older adults.	➢ Allow enough time to practice fine motor tasks required for reading musical notations and learning a new instrument during music training. ➢ Allow enough practice time to process tone sequences when teaching melodic instruments.
Dynamics: Volume of a composition. It is relative and do not indicate specific volume levels	➢ Loudness is a powerful predictor of emotional arousal (Coutinho & Dibben, 2012; Olsen, Dean, Stevens, Bailes, & Cohen, 2015).	➢Dynamics greatly impacts emotional arousal.	➢ Manipulate dynamics to facilitate emotional arousal (e.g., loudness-emotional arousal).

(OnMusic Dictionary, 2015)	➢ Decreased efficiency in hearing sound within a context that includes competing sounds may come from age-related changes in auditory system (Reifinger, 2016).	➢Dynamics influences how older adults process competing sounds.	➢ Manipulate loudness of music in a way that maximizes the quality of music listening experience due to decreased ability to hear sounds as part of aging process in older adults.
Lyrics: Words contained in a song	➢ Lyrics play an important role in eliciting reminiscence (Ashida, 2000). ➢ Lyrics affect listeners' perception of emotion (Stratton & Zalanowski, 1994).	➢ Lyrics elicit reminiscence and affect emotional experiences of a listener.	➢ Use lyrics as a basis for music-based reminiscence. ➢ When selecting songs, consider emotional impact of the lyrical content.
	➢ Linguistic analysis of songs that are often used by music therapists working with older adults suggests that those songs tend to have more positive emotion words than negative emotion words (Yinger & Springer, 2016).	➢ Positive emotion words that are included in songs that are often used among music therapists may contribute to positive therapeutic outcomes.	➢ Use songs that have more positive emotion words than negative emotion words.
Form: Structure of a composition and is based upon repetition, contrast, and variation (OnMusic, 2015)	➢ Low complexity is associated with relaxation/less tension, joy, peace, and positive emotions whereas high complexity is related to tension and sadness (Gabrielsson & Lindstrom, 2010).	➢ Level of complexity in musical forms impacts a listener's emotional state.	➢ Use simple musical form to elicit relaxation, joy, peace, and positive emotions ➢ Use complex musical form to elicit tension, which may be followed by tension resolution.
Harmony: Combination of notes sounded simultaneously	➢ Individuals with depression show negatively biased perceived emotions in music (Eerola & Vuoskoski, 2013).	➢ Clinical use of mode may facilitate emotional clarity.	➢ Use dissonant vs. consonant music to help older adults work on emotional clarity as individuals with depression often show biased emotional identification.
	➢ Musical expectation and anticipation is fundamental mechanism of emotional experience	➢ Musical anticipation that leads to predictability, plays a critical function in	➢ Use predictable mu sic that satisfies antici pation and resolution.

	of music (Huron, 2006).	emotional experience in music.	
	➢ Simple/consonant harmony creates gaiety, pleasantness, attraction, and tenderness whereas complex/dissonant harmony creates gloom, unpleasantness, tension, fear, and anger (Gabrielsson & Lindstrom, 2010).	➢ Consonant vs. dissonant harmony creates different affect.	➢ Manipulate harmonic properties of music to create various emotional expression (e.g., consonant-pleasantness, dissonant-tension).
	➢ Older adults recognize music with a pleasant (consonant) affect better than unpleasant (dissonant) affect (Reifinger, 2016).	➢ Consonant harmony allows older adults to recognize songs better. ➢ Consonant vs. dissonant harmony creates different affect.	➢ Use songs that use consonant harmony to facilitate pleasant affect and personal connection within music.
	➢ Relationship between complexity of music and likability is mediated by predictability thus learning would be most pleasurable with moderate levels of expectation violation based on a person's prior knowledge (Pearce & Wiggins, 2012).	➢ Predictability influences the relationship between song likability and musical complexity. ➢ Expectation violation to the optimal level based on an individual's musical background may increase motivation in learning.	➢ Use coupling of expectation violation and resolution to a moderate level to increase motivation in learning. ➢ Survey and use older adults' prior knowledge about music to guide level of complexity in harmony and expectation violation. ➢ Avoid using too much simplicity and complexity in music. Use expectation violation and resolution to a moderate level to increase motivation in learning.
	➢ The relationship between desirability and complexity of music shows an inverted U-Shape (Berlyne, 1974).	➢ Too much complexity or simplicity in music loses older adults' song likability.	➢ Avoid using too much simplicity and complexity in music.
Style: Often used interchangeably	➢ Characteristics of preferred music among older adults are the following: soothing,	➢ Genre, familiarity, and overall emotional expression of music influences older	➢ Provide soothing, relaxing, enlightening, beautiful, comforting, spiritual, and familiar

with the term, genre. The author uses the term, style to denote both categorical types of music (e.g., classical, pop) as well as description of how music is expected to be played or sound (e.g., original style, jazz style)	relaxing, enlightening, beautiful, comforting, spiritual, and familiar (Flowers & Murphy, 2001).	adults' song likability.	music when older adults select music they would like to listen or sing to.
	➢ Musical expectation is shaped by culture, personal listening history, and musical training (Huron, 2006; Vuust et al., 2005) ➢ Older adults often prefer music that was popular during their early adulthood (Gibbons, 1977; Flowers & Murphy, 2001).	➢ Personal attachment to a musical style influenced by culture, listening history, and training impacts emotional experience. ➢ Popular music that older adults listened to during early adulthood increases likability.	➢ Use musical styles that reflect older adults' musical culture, personal listening history, and training. ➢ Use music older adults listened to during early adulthood to increase deeper emotional experience and social bonding.
	➢ Singing and dancing were two most frequently reported forms of musical activity among older adults (Flowers & Murphy, 2001).	➢ Singing and movement to music that reflect older adults' musical history and taste may increase depth of emotional and reminiscence experience.	➢ Allow singing and moving to music that older adults are stylistically familiar with.
	➢ Lists of songs that are appropriate to use when working with older adults, and categorized by genres and decades can be found in two respective studies: Yinger & Springer (2016) and Cevasco & VanWeelden (2010).	➢ Songs categorized by genres and decades may help intentional selection of songs and reminiscence.	➢ Use lists of songs categorized by genres and decades that are suggested by Yinger & Springer (2016) and Cevasco & VanWeelden (2010) due to the researchers' systematic compilation process
	➢ Home-based music therapy as well as self-administered MT that utilizes music listening of preferred music help decrease depressive symptoms (Hanser & Thompson, 1994).	➢ Listening to music that older adults intentionally select to alter emotional state may decrease negative mood.	➢ Provide home-based music therapy and self-administered music listening that utilizes preferred music to decrease depressive symptoms.
	➢ Recall of a musical piece tends to be close	➢ Stylistic characteristics of a	➢ Stay close to the original style of a

	to original in terms of tempo, rhythm, melodic contours, and pitch, and these music characteristics are preserved with remarkable fidelity (Sacks, 2006).	song that are defined by tempo, rhythm, and melodic contour in part do not become distorted with aging.	musical piece.
	➢ Listening to music that is familiar to an individual from past experiences involves processing in hippocampus and medial/temporal/parietal areas, which are associated with episodic memory (Särkämö, Tervaniemi, & Huotilainen, 2013).	➢ Listening to familiar music that reflects past experiences evokes episodic memory.	➢ Facilitate music listening that reflects past experiences.
	➢ Listening to music that an individual has emotional attachment to elicits emotional experience, involves reward system (i.e., dopaminergic network), and has implication in regulating the autonomic nervous system (Särkämö, Tervaniemi, & Huotilainen, 2013).	➢ Listening to music that has personal emotional meaning help regulate autonomic nervous system.	➢ For music listening, use music that a person has emotional attachment with to allow deeper emotional experience, stimulate reward system, and help regulate emotion and evoke episodic memory.
Meter: Recurring pattern of accents that provide the pulse or beat of music (OnMusic Dictionary, 2015))	➢ Ability to maintain steady beat remains intact through old age (Reifinger, 2016).	➢ Meter is a basis for steady beat and an ability to maintain a steady beat remains intact through old age.	➢ Use meter as a reference point for tempo and rhythm.
	➢ Meter provides "underlying time frame from which rhythm and tempo deviate on artful temporal journeys" (Jones & Bolts, 1989, p. 467).	➢ Meter functions as a foundation for building rhythm and tempo.	➢ Establish meter concept first and then add rhythmic patterns for better perception and processing of musical sounds.
	➢ Theory of dynamic attending suggests meter may function as a temporal reference	➢ Meter allows referential attending as opposed to focused attending by	➢ Establish meter concept first and then add rhythmic patterns for better perception

	frame to which attender initially entrains at a reference level (Jones, 1976).	providing temporal reference, which in turn leads to entrainment effect.	and processing of musical sound. ➢ Use meter as a reference point for tempo and rhythm
	➢ Individuals in contact tend to share synchronized movements and common beat patterns (Norris, 2009). ➢ Joint musical activities facilitate release of endorphins and promote social bonding (Särkämö, Tervaniemi, & Huotilainen, 2013).	➢ Engaging in collective music making promotes social bonding.	➢ Have clients share same beat patterns and synchronized movements in a group setting to facilitate socially meaningful experiences. ➢ Create joint music experiences to facilitate joy of music making and social bonding. ➢ Have clients share same beat patterns and synchronized movements in a group setting to facilitate socially meaningful experiences.

Theory-based Synthesis of the Music

For Intentional Selection**:**

Discuss musical styles and songs that influenced older adults' relationship with music to increase motivation and participation. Also, survey musical background (e.g., musical training) to determine complexity of music elements such as rhythm and harmony. Make individualized song lists that older adults can intentionally select and use based on desired emotional goals outside music therapy sessions to allow deeper emotional experience, stimulate reward system, and regulation of emotion with autonomy and independence.

For Attentional Control**:**

Create rhythm-based experiences to increase attentional control through sensory-motor processing of musical sounds which in turn promotes sustained attention. When facilitating the rhythm-based experiences such as collective drumming that utilizes drums and small percussion instruments, (a) establish well-defined meter concept and then add rhythmic and/or melodic patterns for efficient perception and processing of musical sounds; (b) refer to each client's current knowledge about music to establish optimal level of complexity in music elements; (c) engage clients in sharing common movements and beat patterns in joint music making since movements and beat patterns (e.g., meter) have shared qualities; (d) allow motor synchronization to rhythm when intending to increased feelings of power and triumph; (e) set clear tempo so that clients perceive music in the most organized manner; (f) allow rhythmic patterns to be easily shared by the clients who share the same experiences; (g) use syncopated rhythms followed by non-syncopated rhythms to increase excitement and energy; and (h) utilize timber to manipulate energy, musical color, and emotional expression generated by the music experiences.
When meter and rhythm concepts are well established, add melodies that are familiar to the clients' musical culture. This systematic presentation of music elements will add another layer of complexity in sensory motor processing. In order to participate in this more sophisticated music engagement, the clients have to work harder to process sounds that are produced through tactile, motor, singing, and auditory feedback yet benefit from aesthetic quality and joy of music making.

For Cognitive Stimulation:

Older adults are capable of learning music instruments given enough practice time and rest period, and strategies tailored to their needs. When teaching music, (a) consider each client's relationship with music to increase motivation and personal meaning since musical engagement in later life is associated with earlier music experiences (e.g., instrument choice); (b) for those who do not have much attachment to music, work on building relationship with music; (c) be strategic about how to build new skills by focusing on short phrases as a unit vs. individual notes, and working on fine motor tasks with enough repetition; (d) when teaching how to sing, make sure to use pitch ranges that are comfortable for older adults to sing (i.e., F3-C5 for women and an octave lower for men) yet be opened to use singing range outside their comfort zone; (e) avoid songs that are too fast and rhythmically asymmetrical; and (f) stay close to the original melody.

For Social Interaction:

This component of the MBER model is the most musically and cognitively challenging due to (a) increased complexity in musical layer that is temporally changing; (b) active reciprocity in human interaction characterized by symbolic expression of emotional adversities using music; and (c) verbal discussions about music and self/other generated emotionally challenging situations. Clients who participates in this MBER component will be better equipped with means to express themselves with higher level of emotional clarity and presence of others' musical as well as empathetic support. When

facilitating emotional expression in a group, (a) have clients share the same beat pattern to increase social bonding; (b) use consonant vs. dissonant to create tension and pleasantness; (c) manipulate tempo to create different emotional valence and arousal level; and (d) utilize timbre to build desired energy. In addition, facilitate music-based reminiscence since it evokes episodic memory which is reported to be associated with reduction in depressive symptoms. When selecting songs for reminiscence, pay attention to lyrics since lyrics play a crucial role in eliciting memories. Also, when delivered live, music should be stylistically close to the original for better emotional attunement to music and to others. Along with the reminiscence, song writing that reflects life experiences, importance values, and confirmation of one's identity may bring new existential meaning to current situations. When creating a new song, use simple form to elicit peace and positive emotions. When complex forms are used, make sure tension is resolved.

Program Delivery Schedule

Session Number	MBER Strategy	Overview Focus	Delivery Schedule	Delivery Format	Homework
1-1	IS	Individualized emotional support	W1 (60 min)	I	N/A
1-2	IS	Psychoeducation Assessment	W2 (60 min)	G	N/A
1-3	IS	Goal setting Conscious and effortful decision making	W3 (60 min)	G	HW#1
2-1	AC	Building attentional capacity through meter and simple rhythms	W4 (60 min)	G	N/A
2-2	AC	Building attentional capacity through complex rhythms	W5 (60 min)	G	N/A
2-3	AC	Building attentional capacity through melody and harmony	W6 (60 min)	G	N/A
3-1	CS	Basic music literacy	W7 (60 min)	G	HW#2
3-2	CS	Developing foundational skills for music performance	W8 (60 min)	I or G	HW#3
3-3	CS	Enhancing cognitive ability through music training	W9 (60 min)	I or G	N/A
3-4	CS		W10 (60 min)	I or G	N/A
3-5	CS		W11 (60 min)	I or G	N/A
3-6	CS		W12 (60 min)	I or G	N/A
3-7	CS		W13 (60 min)	I or G	N/A
3-8	CS		W14 (60 min)	I or G	HW#4
3-9	CS	Integration of skills learned in music training	W15 (60 min)	G	N/A
4-1	SI	Interpersonal ER through reminiscence	W16 (60 min)	G	N/A
4-2	SI	Interpersonal ER through reminiscence	W17 (60 min)	G	N/A
4-3	SI	Connecting the past and the present	W18 (60 min)	G	N/A
4-4	SI	Connecting the past, present, and the future	W19 (60 min)	G	N/A

NOTE: AC = Attentional Control, CS = Cognitive Stimulation, ER: Emotion Regulation, G = group, HW = Homework, I = Individual, IS = Intentional Selection, SI = Social Interaction, W = Week

Session-by-Session Content

Module 1: Intentional Selection

Session #1-1	
Overarching Focus	Individualized emotional support
Goals	✓ Explore and acknowledge current emotional state ✓ Make a conscious decision to participate in community-based MBER program
Delivery Setting	Home
Delivery Format	Individual
Materials Needed	Guitar, drums, and small percussion instruments (e.g., shakers, wood block)
Duration	60 minutes

Procedures

Introduction:

■ Briefly explain the purpose of the therapist's visit.

The purpose of the therapist's visit to the client's home is to provide emotional support and empowerment with the intent to facilitate client participation in the community-based Music-based Emotion Regulation (MBER) program. The therapist will use music to help the client explore and acknowledge challenging emotional states. At the end of the session, the client is encouraged to make a conscious decision about whether to participate in the community-based MBER program in which (s)he actively learns strategies to regulate emotion through various music experiences such as interactive music making, music learning and performance, and music-guided reminiscence.

Process:

■ Explore and identify current emotional challenges through instrumental improvisation.

Provide drums and small percussion instruments to express current emotional challenges. Therapist should demonstrate how to play the given instruments and offer clients an opportunity to explore them to make sounds that are reflective of the current emotional state. Provide musical support which may include mirroring of the client's musical expressions (e.g., matching dynamics) and adding rhythmic support (e.g., rhythmic variations).

■ Ask the following questions so that the client processes the music experience and identify current emotional situation with improved emotional clarify:

What was it like to play instruments as a means to express emotions?
What were you trying to say about your emotional challenges?
What made you pick such instruments?
What made you play the way you played the instruments? (e.g., dynamics, rhythmic

patterns)?
How did the way I played with you change or not change the way you played your instruments?
How would you describe your biggest emotional challenges?

- Now that the current emotional challenges have been identified, facilitate another instrumental improvisation that allows the client to explore and identify desired emotional states (e.g., going out to dinner with friends and fully enjoy the moment).

- Ask the following questions so that the client processes the music experience and identify emotional goals with improved emotional clarify:

What was it like to play instruments as means to express emotions this time?
What were you trying to say about the way you would like to feel through playing instruments?
Why did you pick such instruments?
Why did you make such sounds?
How did the way I played with you change or not change the way you played the instruments?
How would you describe the way you want to feel in the future?
What would be emotional goals you would like to work on?

- Address discrepancy between the current and desired emotional state by discussing actions that the client is taking or not taking now and assessing readiness to change. Highlight the importance of conscious and intentional action taking to build healthy emotion regulation.

Eliciting a client's own intrinsic motivation for change by addressing discrepancy between the client' values or goals and current behavior, and subsequently increasing self-efficacy and optimism is called, Motivation Interviewing (MI). MI is a counseling style when a client deals with ambivalence or may have not taken steps to make changes to achieve the goals (Center for Substance Abuse Treatment, 1999).

- Provide a brief description of the MBER program (i.e., process of change and types of music experiences)

- Discuss how the program may help achieve the client-identified emotional goals during the music engagement.

Therapist should be well-aware of the program purpose, theoretical basis for the therapeutic change to facilitate this discussion. Read Theoretical Mechanisms of Change (p. 6) and Literature Support (p. 7) included in the manual.

- Encourage the client to make a conscious decision to participate in the community-based MBER program.

Closure:
- Allow the client to express thoughts and feelings experienced in the session.
- Validate client participation in the session.

Unique Elements of the Session
✧ Individualized home-based music therapy ✧ Addressing the client's own motivation to change to empower participation in the community-based MBER program.
Notes for the Clinician
✧ This session #1-1 is designed to provide emotional support to empower participation in the community-based MBER program. Also, this initial session is time for the therapist to build individual rapport with the client before (s)he transitions into group work. ✧ Create as much of a supportive clinical environment as possible through musical support, reflective listening, and empowerment of the client's own motivation to change. Therapist may consider family involvement in the session when the client requests additional support from family members
Supplemental Resources
✧ Center for Substance Abuse Treatment. (1999). Motivational interviewing as a counseling style. In *Center for substance abuse treatment. Enhancing motivation for change in substance abuse treatment* (p. 39-56), Rockville, MD: US Department of Health & Human Services.

Session #1-2	
Overarching Focus	Psychoeducation and assessment
Goals	✓ Enhance understanding about prevention of late-life depression ✓ Gain understanding about the intervention intent and process of change ✓ Make a conscious decision to continued participation in the program ✓ Assess demographic factors, level of exposure to the risk and protective factors associated with late-life depression, musical background (e.g., training), and music preference
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Summary of the problem and program theory for psychoeducation, assessment tool that allows evaluation of level of exposure to the risk and protective factors, demographic factors, and musical background (i.e., training) and music preference Intervention Delivery Schedule
Duration	60 minutes

Procedures

Introduction:

- Introduce each other using a creative ice-breaker (e.g., each client picks up a card that asks a question such as "Who was your favorite musician when you were in your 20s?")

Process:

- Provide psychoeducation about prevention of late-life depression using Literature Support section of this manual (p. 7).

  I. What is depression? (i.e., symptoms, epidemiological findings, risk and protective factors associated with depression in older persons)
  II. What is prevention and why is it important?
  III. What is prevention and how is it different from treatment?
  IV. Successful outcomes associated with preventive and treatment approaches.

- How can music therapy address prevention of depression in older persons?

  I. Define music therapy
  II. Explain basic and applied research findings that support the use of music in the context of emotion regulation (p. 26).

- Provide a brief overview of the program

  I. Introduce the four emotion regulation strategies within the MBER model (i.e. Intentional Selection, Attentional Control, Cognitive Stimulation, and Social

Interaction) (p. 19)

II. *Briefly explain how the four strategies will guide the four modules of the program (see Program Overview included in the manual, p. 1)*

- Assess level of exposure to risk and protective factors (p. 12)

- Assess clients' musical background and preferences.

I. *Music training (e.g., years of education)*
II. *Current personal relationship to music (e.g., music listening history, involvement in music experiences such as church choir)*
III. *Survey music preferences for music listening*

Have clients circle songs they would like to listen to in Intentional music listening that will be introduced in the following session. Lists of songs that are categorized by decades can be found in Cevasco and VanWeeden (2010). Older adults prefer music they listened to during young adulthood. Therefore, consider the clients' age range and select appropriate decades to help them choose songs from.

Closure:

- Summarize the psychoeducational contents.
- Distribute the Intervention Delivery Schedule with delivery dates added.
- Highlight the importance of setting up realistic goals and putting efforts into achieving the goals, and articulate how clients can benefit from active and committed participation in this program. This will function as a prelude to the following session.

Unique Elements of the Session

✧ Psychoeducation about depression prevention and music therapy, conscious decision making about committed participation in the program

Notes for the Clinician

✧ Knowledge frameworks that correspond to the psychoeducational contents are included in Literature Support section of this manual.

Supplemental Resources

✧ Cevasco, A. M., & VanWeelden, K. (2010). An analysis of songbook series for older adult populations. *Music Therapy Perspectives, 28*, 37-78.

Session #1-3	
Overarching Focus	Goal setting and conscious and effortful decision-making
Goals	✓ Make a conscious decision to actively participate in music therapy sessions. ✓ Use Intentional Music Listening as a way to regulate emotion outside music therapy sessions.
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Intentional Music Listening sheet
Duration	60 minutes

Procedures

Introduction:

- Set up ground rules for the most optimal group interaction and therapeutic outcomes.

  Working through building healthy emotion regulation strategies in a group format may bring many benefits including peer support, social bonding, and practicing program materials. However, it is important that everyone who participates in this program achieve their goals. Facilitate setting up ground rules that all the group members should follow to respect others and achieve personal goals. Keeping confidentiality is an example of a ground rule especially in a program facilitated in a community-based setting.

- Reflect on areas that personally resonated for each client from the previous session.

Process:

- Identify problem areas associated with emotion regulation that the clients currently experience (i.e., depressive symptoms) and discuss their motivation to change.

  This is a recapitulation of the individual session that occurred in session, #1-1. Encourage the clients to talk about how the problems associated with emotional dysregulation influence their lives emotionally, psychologically, socially, cognitively, and physically. Allow each client to share reflections about the individual session which may include thoughts about the music experiences and personally identified goal areas.

- Describe Intentional Selection, the first emotion regulation strategy of the Music-based Emotion Regulation (MBER) model.

  Use Literature Support section of this manual to support the use of Intentional Selection in this module (p. 19). Clients can use the Intentional Selection in two ways:

① *Conscious, intentional, active, and committed participation in music therapy sessions*
② *Intentional music listening*

- Introduce and model how Intentional music listening can be completed outside music therapy sessions by giving the following instructions. Clients should use the form, "Rate Your Mood" included at the conclusion of this module to monitor changes in affect:

  I. *When experiencing negative emotions, be mindful about the situation that caused the negative emotion, and physiological responses and thoughts associated with the negative emotions.*

  II. *Identify and rate your mood state by circling the number that represents how you feel in the given situation, and give a brief description about the emotional state.*

  III. *Select and listen to music that is reflective of your desirable mood state by going through the list of songs that you identified in the initial session and selecting song(s) that you would like to listen to. For example, if you are feeling depressed and experiencing low energy, listen to a song that is slow and calm and then a song that is faster and upbeat. Choose songs that have some level of personal attachment (e.g., style, lyrics).*

  IV. *When listening to the music, be mindful about the sounds coming in through your ear, bodily experiences (e.g., chill), feelings, visual images or memories that you may experience.*

  V. *Identify and rate your mood state by circling the number that represents how you feel <u>after</u> listening to the music, and give a brief description about emotional changes that you have experienced.*

Closure:

- Provide a brief summary about emotional goals that the clients expressed and how Intentional Selection may help establish or maintain healthy and adaptive emotion regulation to achieve those goals.
- Give a brief introduction about the next module (i.e., increasing attentional capacity as a way to build emotion regulation)

Unique Elements of the Session

✧ Intentional music listening for adaptive and self-directed emotion regulation.

Homework (HW#1)

✧ Participate in the Intentional music listening and complete the form, "Rate Your Mood" when experiencing emotional challenges. Encourage clients to use songs they circled on the lists of songs provided in the initial session and add songs to the list if necessary.

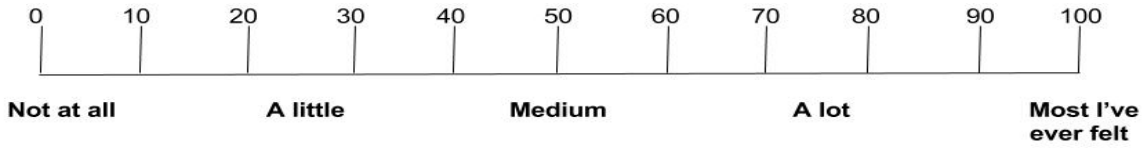
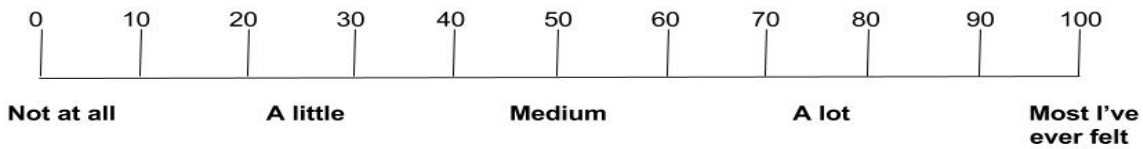
Notes for the Clinician
✧ Encourage clients to continue the Intentional music listening outside music therapy sessions while completing the whole program. ✧ Check periodically how the clients are using the Intentional music listening as a way to monitor and regulate emotion.

Intentional Music Listening

Instructions:

1. When experiencing negative emotions, be mindful about the situation that caused the negative emotion, and examine the physiological responses and thoughts associated with the negative emotions.
2. Identify and rate your mood state by circling the number that represents how you feel at the given situation, and give a brief description about the emotional state.
3. Select and listen to music that is reflective of your desirable mood state by going through the list of songs that you identified in the initial session and selecting song(s) that you would like to listen to. For example, if you are feeling depressed and experiencing low energy, listen to a song that is slow and calm and then a song that is faster and upbeat. Choose songs that have some level of personal attachment (e.g., style, lyrics).
4. When listening to the music, be mindful about the sounds coming in through your ear, bodily experiences (e.g., chill), feelings, visual images or memories that you may experience
5. Identify and rate your mood state by circling the number that represents how you feel after listening to the music, and give a brief description about emotional changes that you have experienced.

Rate your Mood Sheet:

Before Intentional music listening
Situation:
Mood:
Description:
Rate your mood: 
Song(s) selected: Reasons for selecting the song(s):
After Intentional music listening
Situation:
Mood:
Description:
Rate your mood: 

Module 2: Attentional Control

Session #2-1	
Overarching Focus	Building attentional capacity through meter and simple rhythms
Goals	✓ Develop sustained attention through sensory processing of meter and simple rhythms ✓ Learn how to play simple rhythms on a drum
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Music player, drums (e.g., djembe, tubano, frame drum)
Duration	60 minutes

Procedures

Introduction:

- Revisit ground rules for the most optimal group interaction and therapeutic outcomes.
- Share personal experiences with the Intentional music listening.

  When facilitating the discussion, encourage the clients to be as specific as possible about how they were intentionally selecting music listening as an active way of altering negative mood and to describe their experiences on a physiological and emotional level. Also, ask them to talk about choices they made in music selections and why such selections were made.

Process:

- Explain how movement is closely related to characteristics of music elements, especially meter and rhythm.
- Demonstrate the connection between music and movement by encouraging the clients to move based on the meter and rhythmic patterns that the therapist introduces using recorded music (e.g., 4/4 with walking).

  When selecting recorded music that facilitates movements to establish basic meter and rhythm concept, choose songs characterized by strong downbeat, simple rhythmic patterns, and minimum syncopated rhythms.

- Have clients to make simple but creative movements that match metric and rhythmic characteristics of the recorded songs.
- Before introducing instruments, use body percussion to provide multiple sensory processing opportunities for meter and simple rhythms.

The therapist may provide a certain number of beats (e.g., 8 beats) within a meter (e.g., 4/4) and encourage the clients to create a rhythmic sequence using different parts of their body. For example, clients may use clap, clap, tap, tap, pat, pat, clap-tap-rest to complete a rhythmic sequence when given eight beats.

- Introduce drums and have the clients choose a drum they would like to play. Demonstrate how to play simple rhythms on the client-selected instruments using various techniques.
- Introduce simple rhythmic patterns by having the clients mirror therapist-generated patterns on their drum.
- Provide a simple and repetitive rhythmic foundation within a given meter and number of beats on which the clients have freedom to build their own rhythmic patterns in the presence of others' creative rhythmic expressions.
- Provide a different rhythmic foundation 3-4 times and repeat the previous step.
- Have each client come up with an individual rhythmic pattern while the rest follow the patterns as the therapist keeps a steady beat.
- Facilitate a rhythm-based improvisation in which all the clients share the same beat and tempo yet have freedom to create their own rhythm.
- Manipulate tempo if the meter and simple rhythm concepts are well established.

Closure:

- Reflect sensory experiences associated with bodily synchronization to rhythm and attentional focus generated by the rhythm-based music engagement.
- Give a brief overview of the next session by describing how clients will build attentional capacity through more complex rhythms.

Unique Elements of the Session

- ✧ Using movements and sensory experience to build attentional control through me ter and rhythm

Notes for the Clinician

- ✧ Review the Therapeutic Function of Music Plan included in the manual (p.44) to find support for the systematic introduction of the music elements for optimal attentional control.
- ✧ Provide a therapeutic platform on which the clients build attentional capacity on the basis of meter and simple rhythms through sensory and kinesthetic processing of the music elements. This will also lay foundation for more sophisticated rhythms that follow in the next session.

Supplemental Resources

- ✧ Jones, M. R., & Boltz, M. (1989). Dynamic attending and responses to time. *Psychological Review, 96*(3), 459-491.

Session #2-2	
Overarching Focus	Building attentional capacity through complex rhythms
Goals	✓ Increase sustained attention through sensory processing of complex rhythms
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Drums and small percussion instruments (e.g., shaker, guiro)
Duration	60 minutes

Procedures

Introduction:

- Create a simple rhythmic pattern and invite the clients to join a short instrument improvisation using drums and small percussion instruments of their choice.
- Give a brief introduction about how the clients will learn to continue to build attentional capacity by increasing sustained attention through more complex rhythms.

Process:

- Create small groups (i.e. 3-4 groups depending on the number of clients in the group) and assign a rhythmic pattern to each group. Have clients in the same group share the same rhythmic pattern using client selected drums.

  For example, within a shared 4/4 meter, one group may play a simple rhythm that consists of four quarter notes while another plays a rhythm that consists of one half note, two eighth notes, and one quarter note.

- Have all the group play their rhythm at the same time. Use gestures and non-verbal language (e.g., arm and hand movements, feet moving) to manipulate dynamics and tempo. For example, the therapist may use rising and falling hand motions to manipulate dynamics and alter the rate of walking to cue tempo change.

- Now that the small group experience is done, have the group go back to the big circle. Introduce small percussion instruments such as shakers and guiro.

- Assign a unique rhythmic pattern to each individual based on the timbre of his/her chosen instrument. Invite each client to join a rhythm-based experience one after another until everyone plays his/her pattern simultaneously.

- Use gestures and non-verbal language to cue changes in musical expressions such as dynamics, tempo, starting and stopping, and alternating rhythms in the rhythm-based experiences as a whole group.

  Highlight that the clients should pay close attention to the therapist to respond to changes in the music elements. For more information about how to lead a rhythm-based event, read Drum Circle Facilitator's Handbook (Hull & Hill, 2014).

- Increase complexity of music by assigning a more complex rhythm to each individual and repeat the previous step.

  As the clients play more complex rhythms through a collective music making, it is important for the therapist to provide a steady beat with an instrument that is unique in timbre and louder in dynamics to build solid musical foundations.

- When assigning more sophisticated rhythms, use non-syncopated rhythms when consistency in rhythmic patterns is well established on the basis of meter and tempo.

  Read Therapeutic Function of Music Plan (p. 44) for theoretical basis for such rhythmic progression.

- Facilitate another rhythm-based experience by giving clients a rhythmic pattern on which the clients can build their own creative rhythms and engage in free improvisation.

- Use gestures and non-verbal language to cue changes in musical expressions such as dynamics, tempo, starting and stopping, and alternating rhythms in the rhythm-based experiences as a whole group.

  It is the therapist's role to listen to the sounds that are made by the clients and manipulate such music elements for aesthetic purpose. Act as if you are conducting a rhythm-based orchestra in which clients make music in real time based on your gestures and cues.

Closure:

- Reflect and share feelings and thoughts related to the rhythm-based music experience.
- Provide a brief overview of the next session by describing how the clients will continue to build attentional capacity through melody and harmony.

Unique Elements of the Session
✧ Playing instruments to build attentional control through complex rhythms
Notes for the Clinician
✧ Review the Therapeutic Function of Music Plan included in the manual (p. 44) to find support for the systematic introduction of music elements for optimal attentional control.
Flexible Approach
✧ Music therapists can manipulate rhythmic characteristics (i.e., complexity, patterns) based on the client's musical knowledge and cultural background.
Supplemental Resources
✧ Hull, A. & Hill, N. (2014). *Drum circle facilitator's handbook: Building community through rhythm.* Village Music Circles: CA.

Session #2-3	
Overarching Focus	Building attentional capacity through melody and harmony
Goals	✓ Increase attentional capacity through sensory processing of melody and harmony
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Music player, drums and small percussion instruments (e.g., shakers, cabasa)
Duration	60 minutes

Procedures

Introduction:

- Invite clients to join a short instrumental improvisation that is reflective of the previous session.

  In the previous session, clients worked on developing attentional capacity through complex rhythms. Provide a rather sophisticated rhythmic pattern (e.g., syncopated rhythms) and have clients join free rhythm-based improvisation.

Process:

- Introduce rhythmic patterns that are commonly used in songs that older adults are familiar with.

  These rhythmic patterns will be the basis on which familiar melodies will be added for singing experience that follows. The therapist may look at songs that older adults prefer singing in singing activities in music therapy sessions listed in VanWeelden and Cevasco (2009) and introduce rhythmic patterns that correspond to the songs that the therapist chooses from the list.

- On the basis of the rhythmic patterns that have been established, start singing a song that matches the rhythmic quality. Music therapists may add an additional harmonic layer (i.e. accompaniment) using guitar or piano.

- Have clients share the same rhythmic patterns but allow for creative rhythmic ornamentation.

- Repeat step 2 and 3, three to four times.

- Have clients share rhythm-based music experiences throughout module 2 by ans wering the following questions:

  A. What were emotional and physiological responses to music, the therapist, an d peers during the music engagement?
  B. How were you directing your attention? How was the Attentional Control

strategy different from emotion regulation strategies that you often use in your daily lives (e.g., rumination and suppression)?

C. *How could you apply Attentional Control (i.e., distraction, concentration) in your daily lives*?

Closure:

- Reflect overall thoughts and feelings experienced in module 2.
- Briefly introduce the intent and contents of the next module (i.e. music training as a way to maintain/increase cognitive ability)

Unique Elements of the Session

✧ Using instruments and voice to build attentional control through melody and harmony

Notes for the Clinician

✧ Be systematic when building each music element for efficient sensory processing (i.e., order, complexity, density).

Supplemental Resources

✧ VanWeelden, K., & Cevasco, A. M. (2009). Geriatric clients' preferences for specific popular songs to use during singing activities. *Journal of Music Therapy, 46*(2), 147-159.

Module 3: Cognitive Stimulation

Session #3-1	
Overarching Focus	Basic music literacy
Goals	✓ Identify an area of music learning ✓ Gain basic understanding about music literacy (i.e., ability to read music)
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Piano, 4-6 novel song that are written
Duration	60 minutes

Procedures

Introduction:

- Review overall music engagement in the previous module.
- Provide a brief overview of module #3 (i.e., learning music).

Process

- Explain how cognitive abilities are related to emotion regulation and how learning music can facilitate intellectual stimulation.

  Literature suggests that having high cognitive functioning is an important marker for emotional well-being and healthy aging. This third module of the MBER program targets challenging older adults at an intellectual level through music training. To this end, the therapist uses cognitively demanding nature of music that requires complex sensory and cognitive processing of music elements. Read Mansens, Deeg, and Comijs (2017) to increase understanding about how music training helps increase older adults' cognitive functioning.

- Have clients select an instrument they would like to learn. Piano, guitar, or voice lessons may be provided but options regarding the instrument choice for individual music training should be offered based on availability and/or capacity of the therapist.

  If possible, collaborate with music educators who have expertise in the client-chosen instrument. However, instructions pertaining to how individual music training is systematically delivered should be given to the music educators. General guidelines to follow for the music training is given in the following session-by-session content.

- Provide basic music literacy including how to read music so that the clients can use this ability to play an instrument or sing in individual music lessons that follow this current session. When delivering educational contents associated with the music literacy, refer back to how the clients built meter, tempo, and rhythm concepts using sensory and kinesthetic experiences in the previous module, and use that foundational knowledge to

comprehend written music.

When teaching pitch relations, use visualizations (e.g., hand movements for solfege) as humans tend to associate musical pitch with directional concept (e.g., increasing pitch with an ascending object).

- Give multiple opportunities to rehearse the learning materials to maximize the learning outcomes for mature learners.

- Bring 2-3 novel songs that consist of simple melodic lines and rhythms and have clients read music together.

It is suggested that the therapist brings novel compositions that reflect the clients' current state of knowledge in understanding music for optimal learning.

Closure:

- Schedule individual lessons based on time availability of the service provider(s) and the clients.
- Distribute 2-3 novel songs so that the clients can practice reading music at home.

Unique Elements of the Session

✧ Basic music literacy that functions as a foundation for music training

Homework (HW #2)

✧ Practice reading music by reading the songs given by the therapist.

Supplemental Resources

✧ Mansens, D., Deeg, D. J. H., & Comijs, H. C. (2017). The association between singing and/or playing a musical instrument and cognitive functions in older adults. *Aging and Mental Health*, 1-8.

Session #3-2, 3, 4, 5, 6, 7, 8	
Overarching Focus	Developing foundational skills for music performance Enhancing cognitive ability through music training
Goals	✓ Identify goals and strategies associated with music training. ✓ Develop foundational skills that are required to play the client-chosen instrument (e.g., hand/finger movements for piano and breath support for voice).
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Individual or group
Materials Needed	Instruments that the clients chose to learn in the previous session, simple songs in a written format
Duration	60 minutes

Procedures

Introduction:

- Share personal motivation to choose and learn the client-chosen instrument at the beginning of session #3-1.
- Review what was learned in the previous session and introduce new learning materials in session #3-2 through #3-9.

Process:

- Identify realistic goals and practice strategies based on each client's cognitive and physical ability to maximize learning outcomes in older persons (e.g., focusing on short phrases as a single integrated unit rather than individual notes when practicing fine motor skills necessary for learning the identified instrument).

- Use seven sessions (i.e. sessions #3-2, #3-3, #3-4, #3-5, #3-6, #3-7, and #3-8) to teach client-chosen instruments (i.e., guitar, piano, voice, or percussion) through individual lessons.

  A. It is the therapist or the music educator's role (if collaborated) to match given session numbers and individualized learning goals.
  B. Use systematic approach to music learning. For example, when providing guitar lessons, use task analysis for chord acquisition, strumming patterns, and chord transition, and then assign session numbers.
  C. Allow enough time to repeat and rehearse learning materials, and break from cognitive and physical engagement in consideration of the characteristics of mature learners (e.g., declining physical functioning).
  D. Give clients opportunities to express thoughts and feelings associated with learning experiences and provide frequent feedback about the progress they make.
  E. Level of self-efficacy in learning impacts how much older adults spend time in practice materials (Payne et al., 2012). Therefore, create a learning environment in which the clients feel mutually respected and confident about their learning ability.

Closure:

- At the end of each lesson, give clients time to reflect and share their learning experiences including achievements and difficulties in learning, and provide feedback for progress they make.

Unique Elements of the Session

- ✧ Individualized music training, use of clear practice strategies for mature learners

Homework (HW#3)

- ✧ At the end of each individual music lesson, give each client individualized practice materials to practice music skills at home.

Homework (HW#4)

- ✧ Clients will perform one of the songs they learned in music lessons at a concert which will occur outside regular music therapy sessions upon completion of this program. Ask clients to choose a song, practice and bring the song they would like to perform at the concert to a rehearsal time that occurs in session #3-9 which is the last session of this module.

Flexible Delivery

- ✧ Choose appropriate level of music training on the basis of the clients' musical background (i.e., education history).
- ✧ Length of music training can be flexible based on funding and expected learning outcomes. It should be noted that individual learning goals should reflect the length of music training to keep learning strategies realistic and achievable.
- ✧ The therapist can choose a delivery format based on the number of clients in each instrument group, availability of the service provider(s), and funding status.

Notes for the Clinician

- ✧ Review the Therapeutic Function of Music Plan (p. 44) included in this manual to gain insights about learning music for mature learners.
- ✧ Give enough repetition and rest to learn skills necessary to master the self-selected instrument based on self-identified learning goals.

Supplemental Resources

- ✧ Reifinger, J. A. (2016). Age-related changes affecting the learning of music performance skills for older adults. *Psychomusicology: Music, Mind & Brain, 26*(3). 211-219.
- ✧ Payne et al. (2012). Memory self-efficacy predicts responsiveness to inductive reasoning training in older adults. *The Journal of Gerontology Series B: Psychological Sciences and Social Sciences, 67B*(1), 27-35.

Session #3-9	
Overarching Focus	Integration of skills learned in music training
Goals	✓ Rehearse the client-selected song to perform at a concert
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Guitar, piano, or other client-chosen instruments, drums and small percussion instruments used in module 2
Duration	60 minutes

Procedures

Introduction:

- Reflect on personal music learning experiences. Allow clients to express thoughts and feelings associated with learning an instrument at the current emotional state and as mature learners.

Process:

- Give each client an opportunity to rehearse the song they chose to perform at the concert which will occur at the conclusion of this program.

- Provide musical support when each client performs his/her piece (e.g., piano/guitar accompaniment). Also, invite other clients to support the individual through singing or vocal harmonization, or by providing rhythmic accompaniment using drums/percussion instruments introduced in module 2 based on the characteristics of the client-chosen instrument.

  For example, if the clients' self-selected instrument is guitar, having the rest group members sing the client-chosen song while the person plays guitar would be an appropriate way to provide musical support.

- Validate the clients' effort they put in learning a new instrument during individual music lessons.

- Have clients talk about their self-identified goals and the learning process.

- Allow feedback to be shared by the therapist and other clients.

  Make sure that feedback does not become criticism. It is the therapist's role to create a safe environment in which mutual respect is shared and every client feels (s)he is an important member of the group.

- Rehearse all the songs that will be performed at the concert. If the client who performs the song wants musical support from the therapist and/or other clients at the concert as experienced during the session, discuss how the song will be arranged and performed.

Closure:

- Schedule a concert. Encourage clients to invite community and family members to come to the concert.
- Provide a brief description of module 4 (i.e., enhancing social interaction through music-based reminiscence and song writing).

Unique Elements of the Session

- Musical skill integration in the presence of others

Notes for the Clinician

- Highlight the importance of exchanging feedback in a supportive manner to increase quality of the songs that each client presents and to make the performance experience more meaningful to the whole group.

Supplemental Resources

- Roulston, K., Jutras, P., & Kim, S. J. (2015). Adult perspectives of learning m usical instruments. *International Journal of Music Education, 33*(3), 325-335.

Module 4: Social Interaction

Session #4-1	
Overarching Focus	Interpersonal emotion regulation through reminiscence
Goals	✓ Share life experiences/stories associated with a given decade ✓ Develop positive interpersonal emotion regulation in the presence of others through music-based reminiscence
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Guitar, piano, drums, small percussion instruments, lists of songs categorized by decades
Duration	60 minutes

Procedures

Introduction:

- Reflect and share how music learning may have impacted the ability to regulate emotion.
- Revisit ground rules for the most optimal group interaction and therapeutic outcomes.
- Provide a brief overview of module 4.

  In module 4, Social Interaction, clients learn healthy interpersonal emotional regulation skills through active social interaction centered around music-based reminiscence and song writing. Interpersonal emotion regulation skills will be developed by reflecting and sharing of the past, current, and future self, and reappraising current emotional challenges.

Process:

- Distribute song lists that are categorized by decades.
- Choose a decade based on the clients' age range and have the clients circle songs that to which they have personal attachment. Lists of songs categorized by decades can be found in Cevasco and VanWeelden (2010).
- Play the client chosen songs on guitar, piano, or other instruments that fit the style of the song as an accompaniment and invite the clients to sing along with the therapist. Have instruments that have been used throughout the program available to them so that they have opportunities to engage in music experiences other than singing.

  When playing and singing the client-selected song, stay close to the original style so that the clients become easily connected to the past and deepen the emotional experience.

- Facilitate reminiscence based on life events and meaningful life experiences associated with the chosen decade and/or songs.

  The therapist may ask following questions to deepen emotional experiences elicited by music, share meaningful life events and turning points, and facilitate social confirmation:

  1) *How are you emotionally connected with the song?*
  2) *Does the song remind you of anyone important in your life? If so, what memories do you share with the person?*
  3) *What were some crucial life events that happened in the given decade?*
  4) *How did these life events influence who you are now?*

- Allow the clients to talk to each other to ask questions, validate unique life experiences, receive social confirmation, and build empathy and support.

- Discuss any themes that emerged during the music-based reminiscence.

- Choose another decade and repeat the steps of 2, 3, 4, 5, and 6.

Closure:

- Validate each client for sharing life stories.
- Give a brief overview of the next session (i.e., music-based reminiscence centered around another decade).

Unique Elements of the Session

✧ Music-based reminiscence using songs categorized by decades

Flexible delivery

✧ Based on the clients' age range, the therapist chooses decades to focus on during music-based reminiscence.

Notes for the Clinician

✧ Review the Therapeutic Function of Music Plan included in in the manual (p. 44) to find support for the use of music during music-based reminiscence.
✧ Note that the overarching focus of this music-based reminiscence is in the context of interpersonal emotion regulation. In other words, social aspect of the therapeutic experience facilitated by the reminiscence is the primary mechanism of change.
✧ Use group counseling skills such as summarizing and linking to facilitate deeper level emotional processing and empathetic responses.

Supplemental Resources

✧ Cevasco, A. M., & VanWeelden, K. (2010). An analysis of songbook series for older adult populations. *Music Therapy Perspectives, 28*, 37-78.

Session #4-2	
Overarching Focus	Interpersonal emotion regulation through reminiscence
Goals	✓ Share life experiences/stories associated with a given decade ✓ Develop positive interpersonal emotion regulation in the presence of others through music-based reminiscence
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Guitar, piano, drums, small percussion instruments, lists of songs categorized by decades
Duration	60 minutes

Procedures

Introduction:

- Reflect and share reminiscence experience from the previous session.

Process:

- Choose another decade based on the clients' age range and have the clients circle songs that they find personal attachment with. Lists of songs categorized by decades can be found in Cevasco and VanWeelden (2010).

- Play the client chosen songs on guitar, piano, or other instruments that fit the style of the song as an accompaniment and invite the clients to sing along with the therapist. Have instruments that have been used throughout the program available to them so that they have opportunities to engage in music experiences other than singing.

  When playing and singing the client-selected song, stay close to the original style so that the clients become easily connected to the past and deepen the emotional experience.

- Facilitate reminiscence based on life events and meaningful life experiences associated with the chosen decade and/or songs.

  The therapist may ask following questions to deepen emotional experiences elicited by music, share meaningful life events and turning points, and facilitate social confirmation:

  1) *How are you emotionally connected with the song?*
  2) *Does the song remind you of anyone important in your life? If so, what memories do you share with the person?*
  3) *What were some crucial life events that happened in the given decade?*
  4) *How did these life events influence who you are now?*

- Allow the clients to talk to each other to ask questions, validate unique life experiences, receive social confirmation, and build empathy and support.

- Discuss any themes that emerged during the music-based reminiscence.
- Choose another decade and follow the steps of 2, 3, 4, 5, and 6.

Closure:

- Discuss any themes that emerged throughout reminiscence and thank each client for sharing their life stories.
- Provide a brief overview about the next session (i.e., song writing, termination).

Unique Elements of the Session

- ✧ Music-based reminiscence using songs categorized by decades

Flexible Delivery

- ✧ Based on the clients' age range, the therapist chooses decades to focus on during music-based reminiscence.

Notes for the Clinician

- ✧ Review the Therapeutic Function of Music Plan included in in the manual (p. 44) to find support for the use of music during music-based reminiscence.
- ✧ Note that the overarching focus of this music-based reminiscence is in the context of the interpersonal emotion regulation. In other words, social aspect of the therapeutic experience facilitated by the reminiscence is the primary mechanism of change.
- ✧ Use group counseling skills such as summarizing and linking to facilitate deeper level emotional processing and empathetic responses.

Supplemental Resources

- ✧ Cevasco, A. M., & VanWeelden, K. (2010). An analysis of songbook series for older adult populations. *Music Therapy Perspectives, 28*, 37-78.

Session #4-3	
Overarching Focus	Connecting the past and the present
Goals	✓ Verbally and non-verbally express emotional state or difficulties in a safe social environment ✓ Reappraise current emotional challenges through peer support and music-based reminiscence
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Guitar, piano, drums, and small percussion instruments
Duration	60 minutes

Procedures

Introduction:

- Reflect and share reminiscence experiences from the previous two sessions.

Process:

- Provide clients musical tools (e.g., playing instruments, singing) to express current emotional state or difficulties using instruments and songs they have been exposed to/learned throughout the program.

- During the musical expression, have each client to select ways to express his/her emotions (e.g., timbre and melody) and the rest to support the musical statement through mirroring or rhythmic/harmonic support.

- Have the clients share meanings of the symbolic musical expressions.

- Facilitate social interaction by allowing reciprocity while each client articulates meaning of his/her symbolic expression of emotion. Ask clients to talk directly to each other, ask questions, and share thoughts and feelings.

  Now that the clients have spent time listening to music, learning an instrument, and engaging in collective music making throughout the program, the quality of emotional expression through music maybe differ from what was exhibited during the initial individual session of the program. It is recommended that the therapist be observant of each client's musical/verbal expression and make note of any differences that the clients made regarding how they use different music elements as means to express emotions. Areas to consider when evaluating the clients' musical expressions are as follows: emotional clarity, intentionality in selecting ways to express emotions, and reciprocity in musical communications with others.

- Discuss how the presence of others impacted the musical statement.

- Connect the past and the present by directing the clients to the music-based

reminiscence experienced in the previous two sessions. Encourage clients to reappraise current emotional challenges based on the reflections from the reminiscence experience and others' musical and emotional support.

Closure:

- Discuss any themes that emerged in the musical and verbal sharing of the current emotional state.
- Provide a brief overview of the following session (i.e., song writing, termination)

Unique Elements of the Session

- ✧ Use of musical tools and knowledge gained throughout the program as a way to express emotion and to receive and provide social support

Notes for the Clinician

- ✧ Avoid distraction and have one client to be the focus at a time and the rest to musically/verbally support that person.
- ✧ Use group counseling skills such as summarizing and linking to facilitate deeper level emotional processing and empathetic responses.

Session #4-4	
Overarching Focus	Connecting the past, the present, and the future
Goals	✓ Develop interpersonal emotion regulation through a song writing experience ✓ Identify healthy emotion regulation strategies to be used after the conclusion of the program
Delivery Setting	On-site community-based facility or a music therapy clinic
Delivery Format	Group
Materials Needed	Guitar, piano, client chosen instruments if necessary
Duration	60 minutes

Procedures

Introduction:

- Reflect thoughts and feelings about the previous session and termination of the program.

Process:

- Revisit emotional goals identified at the beginning of module 1 and connect them with the past articulated through the reminiscence experienced in session #4-1, 2 and the present articulated through the symbolic musical expressions experienced in session #4-3. Ask the following questions to help connect the past, present, and the future in the context of emotional well-being.

  1) *What did you experience as you were reviewing crucial life events and important relationships?*
  2) *What were the emotional challenges you self-identified at the beginning of the program?*
  3) *Have you experienced any changes in your ability to regulation emotion since you started this program?*
  4) *How did being in the group of peers help when working through your emotional challenges?*
  5) *What are helpful and adaptive emotion regulation strategies that you may continue to use after termination of the program?*

- Collaborate on writing a song that reflects changes they have experienced throughout the program, existential meaning that may direct future healthy and adaptive emotion regulation, and actions to take after termination).

  When facilitating song writing, use lyrics and form as a way to express their experiences in the program and to confirm continued efforts to develop healthy emotion regulation that may lead to decreased depressive symptoms. Use dissonant sounds to create tension and consonant sounds to deepen personal connection to music, experience safety, and create pleasantness. Use upward contour or high pitch level to express positive emotions. Use downward contour or low pitch level to express

negative emotions. Allow consistency or changes in tempo to be shared by all the clients. Use increased tempo to facilitate expressiveness and decreased tempo, feelings of sadness. Involve clients in motor synchronization to facilitate feelings or triumph and achievement (e.g., playing instrument through repetitive rhythms). Use syncopated rhythms followed by non-syncopated rhythms to express excitement and energy. Read Therapeutic Function of Music Plan included in the manual (p. 44) for theoretical support that informs the above guideline.

- Collaborate on making creative arrangement of the song based on the clients' increased music skills and lyrical contexts of the song. During the arrangement process, allow dialogues to occur among clients so that they experience peer support and a sense of achievement.

- Play and sing the arranged piece in a collaborative manner. Let the clients know that the arranged piece will also be performed at the concert that will occur at the conclusion of this program.

- Discuss how the song helped connect the past, present, and future in the context of emotion regulation.

Closure:

- Bring closure to the program by having the clients reflect on changes in abilities to regulate emotions, share overall experiences, and acknowledge each client's contribution to the group process.

- Briefly explain what the clients are expected to do at the concert that the clients scheduled at the beginning of module 3.

- Schedule follow-up meetings.

Unique Elements of the Session

✧ Unique Elements of the Session: song writing as a way to reflect past life experiences and future goals, and to find meaning and hope for current situations

Flexible Delivery

✧ The therapist may choose to add an additional one or two sessions based on quality of social interactions characterized by musical and verbal exchange.

Notes for the Clinician

✧ Make sure to have each client identify and continue to use the healthy emotion regulation strategies they learned in the program.

Fidelity Criteria

Instructions:

Fidelity criteria plays a crucial role in evaluating how faithfully and consistently interventions are delivered according to the essential elements of the intervention delivery. The following fidelity criteria was adapted from Gearing et al., (2011) to reflect current stage of manual development (i.e., initial stage of manual development in the continuum of the MBER-line research trajectory) and includes four major components: framework, manual development, monitoring intervention delivery, and intervention receipt. The author provides the essential elements of the intervention delivery categorized by the four major components identified above. Prior to implementing the MBER intervention, please be aware of those essential elements of the intervention delivery. At the end of each session, please evaluate intervention delivery by making note of those essential elements that correspond to the two categories listed in the Fidelity Criteria: Monitoring Intervention Delivery and Intervention Receipt. At the conclusion of the intervention, please complete the checklist by using the following rating system: Absent/minimal (0 point), Moderate (1 point), extensive (2 points). Calculate total fidelity score by adding all the numbers assigned to each essential element divided by the maximum points possible (28 points).

Fidelity Criteria	Absent/Minimal (0 point)	Moderate (1 point)	Extensive (2 points)
Framework+			
➢ Theoretical orientation ➢ Program goals ➢ Participant characteristics ➢ Interventionist characteristics ➢ Mode of delivery			
Manual Development+			
➢ Program model (e.g., well defined objectives, procedures, outcomes) ➢ Session model (e.g., well-defined objectives, procedures, outcomes) ➢ Operational definitions ➢ Dose ➢ Adaptation guidance ➢ Timing ➢ Cultural considerations for intervention if applicable			
Monitoring Intervention Delivery			
➢ Differentiation (i.e., clear differentiation in intervention and control groups)			
➢ Intervention components (e.g., implementation of the four MBER strategies)			
➢ Interventionist competence (i.e., empathy, warmth, and sensitivity with the procedures)			
➢ Monitoring drift			
➢ Corrective feedback			
➢ Threats (e.g., ambiguity in documentation and the model, lack of administrative support)			
➢ Measurements			
Intervention Receipt			
➢ Intended dose received (i.e., session attendance)			
➢ Participant comprehension (i.e., knowledge, skills)			
➢ Participant adherence (i.e., engagement and adherence with the contents delivered)			
➢ Threats: participant resistance, defensiveness, and comorbid conditions			
➢ Measurement: reliable and valid measure(s)			

This fidelity criteria were modified from Gearing et al. (2011) to make this manual relevant to the current stage of manual development.

+ Note that within these two sections, framework ad manual development, fidelity scores are evaluated as a group rather than by individual

References

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